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MOTOR VEHICLE SAFETY STANDARDS

GOVERNMENT
Storage



HEARINGS BEFORE A SUBCOMMITTEE OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE HOUSE OF REPRESENTATIVES

EIGHTY-SEVENTH CONGRESS

FIRST SESSION

ON

H.R. 903

A BILL TO REQUIRE CERTAIN SAFETY DEVICES ON
MOTOR VEHICLES SOLD, SHIPPED, OR USED IN
INTERSTATE COMMERCE, AND FOR OTHER PURPOSES

H.R. 1341

A BILL TO REQUIRE PASSENGER-CARRYING MOTOR
VEHICLES PURCHASED FOR USE BY THE FEDERAL
GOVERNMENT TO MEET CERTAIN SAFETY STANDARDS

H.R. 2446

A BILL TO PROVIDE THAT HYDRAULIC BRAKE FLUID
SOLD OR SHIPPED IN COMMERCE FOR USE IN MOTOR
VEHICLES SHALL MEET CERTAIN SPECIFICATIONS
PRESCRIBED BY THE SECRETARY OF COMMERCE

MARCH 24, 27, 28, APRIL 14, 17, AND 18, 1961

Printed for the use of the Committee on Interstate and Foreign Commerce



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CONTENTS

Text of—	Page
H.R. 903.....	23
H.R. 1341.....	24
H.R. 2446.....	1
Report of—	
Bureau of the Budget on H.R. 1341.....	26
Commerce Department on—	
H.R. 903.....	25
H.R. 1341.....	27
H.R. 2446.....	2
General Services Administration on H.R. 1341.....	25
Health, Education, and Welfare Department on H.R. 1341.....	28
Justice Department on H.R. 2446.....	2
Statement of—	
Albright, W. E., Deputy Director of Safety, Department of the Army.....	277
Bennett, Hon. Charles E., a Representative in Congress from the State of Florida.....	55
Bouchard, Robert L., National Auto & Flat Glass Dealers Association, and Glass Distributors, Inc.....	150, 312
Chapman, Dr. Albert L., Chief, Division of Accident Prevention, Public Health Service, Department of Health, Education, and Welfare.....	37, 225
Cohen, Wilbur J., Assistant Secretary, Department of Health, Education, and Welfare.....	225
Cox, Ernest G., Chief, Section of Motor Carrier Safety, Interstate Commerce Commission.....	287
Farris, S. O., Deputy Commissioner, Motor Equipment, General Services Administration.....	249
Flatley, J. W., Assistant Commissioner, Office of Property Management, General Services Administration.....	249
Ford, Peyton, general counsel, National Auto & Glass Dealers Association.....	312
Gandelot, Howard K., engineer in charge, vehicle safety section, General Motors engineering staff.....	182
Hardin, Dale W., congressional liaison officer, Interstate Commerce Commission.....	287
Heppenstall, C. W., Heppenstall Industries, Delray Beach, Fla.....	174
Holmes, E. H., Assistant Commissioner for Research, Bureau of Public Roads, Department of Commerce.....	259
Isbrandt, Ralph H., chairman, engineering advisory committee, Automobile Manufacturers Association.....	81
Jerome, Walter C., president, Hollow Boring Corp., Worcester, Mass.....	327
Johnston, Paul, executive assistant, Bureau of Public Roads, Department of Commerce.....	70
Keim, Larry, manager, technical services, automotive sales, Glass Division, Pittsburgh Plate Glass Co.....	182
Kibbee, Lewis C., director, Engineering Department, American Trucking Associations, Inc.....	12
Mayo, Leonard W., executive director, Association for the Aid of Crippled Children.....	142
McCart, John A., director of legislation, American Federation of Government Employees.....	59
McKinney, A. C., Jr., Chief, Industrial Supplies and Equipment Branch, National Buying Division, Federal Supplies Service, General Services Administration.....	249
Moore, John L., Administrator, General Services Administration.....	249

Statement of—Continued	Page
Moore, John O., New York, N.Y.	138, 168
Naler, Maj. John, Office of Chief, Legislative Liaison, Department of the Army	277
Prisk, Charles, Bureau of Public Roads, Department of Commerce	6, 70, 259
Qualls, Herbert, Director, Bureau of Motor Carriers, Interstate Commerce Commission	287
Ribicoff, Hon. Abraham, Secretary of Health, Education, and Welfare	225
Richards, Karl M., manager, Field Services Department, Automobile Manufacturers Association	81, 182
Richardson, Henry, DeBell & Richardson, Hazardville, Conn.	312
Rugg, Ormond I., glass engineer, Glass Division, Ford Motor Co.	182
Ryan, Joseph D., director of research and development, Libbey-Owens-Ford Glass Co.	182
Sherman, William F., manager, Engineering & Technical Data Department, Automobile Manufacturers Association	81
Siesel, E. H., chairman, laminated safety glass committee, National Auto & Glass Dealers Association	312
Tenney, Edward A., Barton City, Mich.	147
Turnbull, James R., National Auto & Flat Glass Dealers Association	150
Whitton, Rex M., Federal Highway Administrator, Bureau of Public Roads, Department of Commerce	259
Additional information submitted for the record by—	
American Association of Motor Vehicle Administrators, Inc.:	
Letters from L. S. Harris, executive director	20
Statement of Leland S. Harris, executive director, made before subcommittee, July 8, 1959	35
American Medical Association, letter from Dr. F. J. L. Blasingame, executive vice president	69
American Public Health Association, statement of Dr. Berwyn F. Mattison, executive director	375
Army Department:	
Figures concerning accidents at military installations	287
Number of passenger-type motor vehicles included in budget for fiscal years 1960, 1961, and 1962, table	284
Automobile Manufacturers Association:	
Hydraulic fluids	97
Letter from Harlan V. Hadley, manager, Washington office, transmitting information	200
Personnel of various committees	90-95
Brown, Russell I., statement of	170
Campbell, Dr. Horace E., letter from	65
Chrysler Corp., letter from Paul C. Ackerman, vice president, engineering	17, 34
Commerce Department:	
Letter from Rex M. Whitton, Federal Highway Administrator, Bureau of Public Roads	268
Letters from Hon. Luther H. Hodges, Secretary	372, 373
List of current research projects in safety, Bureau of Public Roads	263
Press release No. 23, March 17, 1961, seat belt program	79
Dusinberre, Dr. R. K. Y., letter from, transmitting statement	377
Freeman, Hon. Orville L.:	
Proposed resolution for action by Governors' conference	177
Statement of	178
General Services Administration:	
Letters from John L. Moore, Administrator	148, 150, 371
Statement concerning passenger-carrying motor vehicles in connection with H.R. 1341	149

Additional information submitted for the record by—Continued

	Page
Health, Education, and Welfare Department:	
Accident prevention program, statistical summary, tables.....	245, 246
Accident prevention research grants, table.....	236
Death rates from ingestion of poisonous substances, United States, 1947-57, chart.....	51
Death rates from work accidents, manufacturing industry, United States, 1933-57, chart.....	49
Deaths from motor vehicle accidents and from work accidents, United States, 1948-59, chart.....	50
Estimated cost of motor vehicle injuries in 1959.....	41
Letter of May 31, 1960, from then Secretary, Hon. Arthur S. Flemming, to Senator Warren G. Magnuson.....	53
Number of personnel employed in accident prevention research projects supported with PHS funds, March 1, 1961, table.....	45
Vehicular work injuries sustained by Federal employees, calendar year 1957.....	43
Interstate Commerce Commission:	
Change in motor carrier fitness law sought, press release, February 8, 1961.....	303
Letter from Everett Hutchinson, Chairman.....	298
Letters from Rupert L. Murphy, Chairman, Division 1.....	304, 311
Kuhn, Dr. Hedwig S., letter from.....	374
Labor Department, letter from William McCauley, Director, Bureau of Employees' Compensation, transmitting information on injuries.....	62
Libby-Owens-Ford Glass Co., letter from Geo. E. Hill, Jr., district manager.....	314
National Auto & Flat Glass Dealers Association:	
Bulletin to all dealers from Chevrolet Division, General Motors Corp.....	167
Statement of Henry M. Richardson.....	326
National Safety Council, letter from G. S. Stewart, executive vice president.....	14
Roberts, Hon. Kenneth A.:	
"Brake Fluid Danger," article from Automotive News, August 15, 1960.....	3
Excerpt from publication of New York State Automobile Associ- ation.....	371
Federal Standard No. 122, purchase of motor vehicles for Federal agencies.....	335
Research and planning, section 307, United States Code, 1958 edition.....	267
"Ribicoff Asks Fumes Control," article from Sunday Star, April 16, 1961.....	243
"Shatterproof Hits AMA's Position on Glass Safety," article from Automotive News, March 27, 1961.....	65
Ryan, James, statement of.....	33
Shelden, Dr. C. Hunter, letter from.....	66
Sieben, Harry A.:	
Letter from, transmitting resolution.....	176
Telegram from.....	32
Smith, Dr. Warren W., letter from.....	375
Steiglitz, William I., statement of.....	32
Woodward, Dr. Fletcher D.:	
"An Apology to Those Who Are About To Die," address printed in March-April 1961 issue of Police.....	330
Letter from.....	67
Yudenfriend, Herbert, statement of.....	324

100	1967-1968	1967-1968
101	1968-1969	1968-1969
102	1969-1970	1969-1970
103	1970-1971	1970-1971
104	1971-1972	1971-1972
105	1972-1973	1972-1973
106	1973-1974	1973-1974
107	1974-1975	1974-1975
108	1975-1976	1975-1976
109	1976-1977	1976-1977
110	1977-1978	1977-1978
111	1978-1979	1978-1979
112	1979-1980	1979-1980
113	1980-1981	1980-1981
114	1981-1982	1981-1982
115	1982-1983	1982-1983
116	1983-1984	1983-1984
117	1984-1985	1984-1985
118	1985-1986	1985-1986
119	1986-1987	1986-1987
120	1987-1988	1987-1988
121	1988-1989	1988-1989
122	1989-1990	1989-1990
123	1990-1991	1990-1991
124	1991-1992	1991-1992
125	1992-1993	1992-1993
126	1993-1994	1993-1994
127	1994-1995	1994-1995
128	1995-1996	1995-1996
129	1996-1997	1996-1997
130	1997-1998	1997-1998
131	1998-1999	1998-1999
132	1999-2000	1999-2000
133	2000-2001	2000-2001
134	2001-2002	2001-2002
135	2002-2003	2002-2003
136	2003-2004	2003-2004
137	2004-2005	2004-2005
138	2005-2006	2005-2006
139	2006-2007	2006-2007
140	2007-2008	2007-2008
141	2008-2009	2008-2009
142	2009-2010	2009-2010
143	2010-2011	2010-2011
144	2011-2012	2011-2012
145	2012-2013	2012-2013
146	2013-2014	2013-2014
147	2014-2015	2014-2015
148	2015-2016	2015-2016
149	2016-2017	2016-2017
150	2017-2018	2017-2018
151	2018-2019	2018-2019
152	2019-2020	2019-2020
153	2020-2021	2020-2021
154	2021-2022	2021-2022
155	2022-2023	2022-2023
156	2023-2024	2023-2024
157	2024-2025	2024-2025
158	2025-2026	2025-2026
159	2026-2027	2026-2027
160	2027-2028	2027-2028
161	2028-2029	2028-2029
162	2029-2030	2029-2030
163	2030-2031	2030-2031
164	2031-2032	2031-2032
165	2032-2033	2032-2033
166	2033-2034	2033-2034
167	2034-2035	2034-2035
168	2035-2036	2035-2036
169	2036-2037	2036-2037
170	2037-2038	2037-2038
171	2038-2039	2038-2039
172	2039-2040	2039-2040
173	2040-2041	2040-2041
174	2041-2042	2041-2042
175	2042-2043	2042-2043
176	2043-2044	2043-2044
177	2044-2045	2044-2045
178	2045-2046	2045-2046
179	2046-2047	2046-2047
180	2047-2048	2047-2048
181	2048-2049	2048-2049
182	2049-2050	2049-2050
183	2050-2051	2050-2051
184	2051-2052	2051-2052
185	2052-2053	2052-2053
186	2053-2054	2053-2054
187	2054-2055	2054-2055
188	2055-2056	2055-2056
189	2056-2057	2056-2057
190	2057-2058	2057-2058
191	2058-2059	2058-2059
192	2059-2060	2059-2060
193	2060-2061	2060-2061
194	2061-2062	2061-2062
195	2062-2063	2062-2063
196	2063-2064	2063-2064
197	2064-2065	2064-2065
198	2065-2066	2065-2066
199	2066-2067	2066-2067
200	2067-2068	2067-2068
201	2068-2069	2068-2069
202	2069-2070	2069-2070
203	2070-2071	2070-2071
204	2071-2072	2071-2072
205	2072-2073	2072-2073
206	2073-2074	2073-2074
207	2074-2075	2074-2075
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212	2079-2080	2079-2080
213	2080-2081	2080-2081
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217	2084-2085	2084-2085
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220	2087-2088	2087-2088
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223	2090-2091	2090-2091
224	2091-2092	2091-2092
225	2092-2093	2092-2093
226	2093-2094	2093-2094
227	2094-2095	2094-2095
228	2095-2096	2095-2096
229	2096-2097	2096-2097
230	2097-2098	2097-2098
231	2098-2099	2098-2099
232	2099-2100	2099-2100
233	2100-2101	2100-2101
234	2101-2102	2101-2102
235	2102-2103	2102-2103
236	2103-2104	2103-2104
237	2104-2105	2104-2105
238	2105-2106	2105-2106
239	2106-2107	2106-2107
240	2107-2108	2107-2108
241	2108-2109	2108-2109
242	2109-2110	2109-2110
243	2110-2111	2110-2111
244	2111-2112	2111-2112
245	2112-2113	2112-2113
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249	2116-2117	2116-2117
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268	2135-2136	2135-2136
269	2136-2137	2136-2137
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271	2138-2139	2138-2139
272	2139-2140	2139-2140
273	2140-2141	2140-2141
274	2141-2142	2141-2142
275	2142-2143	2142-2143
276	2143-2144	2143-2144
277	2144-2145	2144-2145
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279	2146-2147	2146-2147
280	2147-2148	2147-2148
281	2148-2149	2148-2149
282	2149-2150	2149-2150
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284	2151-2152	2151-2152
285	2152-2153	2152-2153
286	2153-2154	2153-2154
287	2154-2155	2154-2155
288	2155-2156	2155-2156
289	2156-2157	2156-2157
290	2157-2158	2157-2158
291	2158-2159	2158-2159
292	2159-2160	2159-2160
293	2160-2161	2160-2161
294	2161-2162	2161-2162
295	2162-2163	2162-2163
296	2163-2164	2163-2164
297	2164-2165	2164-2165
298	2165-2166	2165-2166
299	2166-2167	2166-2167
300	2167-2168	2167-2168
301	2168-2169	2168-2169
302	2169-2170	2169-2170
303	2170-2171	2170-2171
304	2171-2172	2171-2172
305	2172-2173	2172-2173
306	2173-2174	2173-2174
307	2174-2175	2174-2175
308	2175-2176	2175-2176
309	2176-2177	2176-2177
310	2177-2178	2177-2178
311	2178-2179	2178-2179
312	2179-2180	2179-2180
313	2180-2181	2180-2181
314	2181-2182	2181-2182
315	2182-2183	2182-2183
316	2183-2184	2183-2184
317	2184-2185	2184-2185
318	2185-2186	2185-2186
319	2186-2187	2186-2187
320	2187-2188	2187-2188
321	2188-2189	2188-2189
322	2189-2190	2189-2190
323	2190-2191	2190-2191
324	2191-2192	2191-2192
325	2192-2193	2192-2193
326	2193-2194	2193-2194
327	2194-2195	2194-2195
328	2195-2196	2195-2196
329	2196-2197	2196-2197
330	2197-2198	2197-2198
331	2198-2199	2198-2199
332	2199-2200	2199-2200
333	2200-2201	2200-2201
334	2201-2202	2201-2202
335	2202-2203	2202-2203
336	2203-2204	2203-2204
337	2204-2205	2204-2205
338	2205-2206	2205-2206
339	2206-2207	2206-2207
340	2207-2208	2207-2208
341	2208-2209	2208-2209
342	2209-2210	2209-2210
343	2210-2211	2210-2211
344	2211-2212	2211-2212
345	2212-2213	2212-2213
346	2213-2214	2213-2214
347	2214-2215	2214-2215
348	2215-2216	2215-2216
349	2216-2217	2216-2217
350	2217-2218	2217-2218
351	2218-2219	2218-2219
352	2219-2220	2219-2220
353	2220-2221	2220-2221
354	2221-2222	2221-2222
355	2222-2223	2222-2223
356	2223-2224	2223-2224
357	2224-2225	2224-2225
358	2225-2226	2225-2226
359	2226-2227	2226-2227
360	2227-2228	2227-2228
361	2228-2229	2228-2229
362	2229-2230	2229-2230
363	2230-2231	2230-2231
364	2231-2232	2231-2232
365	2232-2233	2232-2233
366	2233-2234	2233-2234

MOTOR VEHICLE SAFETY STANDARDS

FRIDAY, MARCH 24, 1961

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts presiding.
Present: Representatives Roberts, Rogers of Florida, Nelsen, and Thomson.

Also present: W. E. Williamson, clerk.

Mr. ROBERTS. The subcommittee will be in order.

The Subcommittee on Health and Safety is meeting this morning for hearings on H.R. 2446, to establish safety standards for motor vehicle brake fluid.

(H.R. 2446 and agency reports follow:)

[H.R. 2446, 87th Cong., 1st sess.]

A BILL To provide that hydraulic brake fluid sold or shipped in commerce for use in motor vehicles shall meet certain specifications prescribed by the Secretary of Commerce

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That not later than 90 days after the date of the enactment of this Act the Secretary of Commerce shall prescribe and publish in the Federal Register specifications for hydraulic brake fluids for use in motor vehicles. The standards so published shall provide the public with safe and efficient hydraulic fluids for motor vehicle hydraulic braking systems in order to promote highway safety.

SEC. 2. (a) The manufacture for sale, the sale, or the offering for sale, in commerce, or the importation into the United States, or the introduction, delivery for introduction, transportation or causing to be transported, in commerce, or for the purpose of sale, or delivery, after sale, in commerce, of any such hydraulic brake fluid which does not meet the specifications prescribed by the Secretary of Commerce as set forth in the first section of this Act shall be unlawful.

(b) Whoever violates this section shall be fined not more than \$1,000, or imprisoned not more than one year or both.

SEC. 3. As used in this Act—

(1) The term "commerce" means (A) commerce between any place in a State, the District of Columbia, the Commonwealth of Puerto Rico, or a possession of the United States and any place outside thereof, and (B) commerce wholly within the District of Columbia or any such possession; and

(2) The term "motor vehicle" means any vehicle or machine propelled or drawn by mechanical power and used on the highways.

SEC. 4. This Act shall take effect on the date of its enactment except that section 2 shall take effect on such date as the Secretary of Commerce shall determine but such date shall be not more than ninety days after the date of publication of specifications first established under the first section of this Act. If such specifications first established are thereafter changed, such standards as so changed shall take effect on such date as the Secretary of Commerce shall determine but such date shall not be more than ninety days after the date of their publication in accordance with the provisions of the first section of this Act.

MOTOR VEHICLE SAFETY STANDARDS

THE SECRETARY OF COMMERCE,
Washington, D.C., March 24, 1961.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: This letter is in reply to your request of February 9, 1961, for the views of this Department with respect to H.R. 2446, a bill to provide that hydraulic brake fluid sold or shipped in commerce for use in motor vehicles shall meet certain specifications prescribed by the Secretary of Commerce.

The bill would require the Secretary of Commerce, within 90 days after its enactment, to prescribe and publish in the Federal Register, specifications for hydraulic brake fluid sold or shipped in commerce for use in motor vehicles. Thereafter a transaction in commerce involving brake fluid which does not meet these specifications would be unlawful, and punishable by fine or imprisonment, or both.

It is our understanding that the General Services Administration has issued specifications with respect to brake fluids which are applicable to Government-owned vehicles. Also, 27 States and the District of Columbia have imposed regulations relating to the marketing of inferior brake fluids.

This Department is certainly sympathetic with the safety objectives contemplated by H.R. 2446. However, we would also emphasize that the several States have traditionally exercised regulatory authority over motor vehicle safety features; and it would seem that the entry of the Federal Government into the field of brake fluid standards regulation presents the basic question of the proper role of the Federal Government generally in the regulation of motor vehicle equipment.

We would like to suggest that it might be helpful for the President's Commission on Intergovernmental Relations to give careful study to the basic question of the Federal Government's role in the regulation of motor vehicle equipment, before decision is made with respect to brake fluid standards. It will be observed that the views expressed above are consistent with our comments on H.R. 903, which deals with additional aspects of safety equipment on motor vehicles.

In any event, we believe that if the bill in question is enacted into law, a minimum of at least 180 days should be allowed for preparation and publication of specifications. Also, the bill should require the labeling of brake fluids as conforming to the specifications to be promulgated.

The Bureau of the Budget advised there would be no objection to the submission of this report from the standpoint of the administration's program.

Sincerely yours,

EDWARD GUDEMAN,
Under Secretary of Commerce.

DEPARTMENT OF JUSTICE,
OFFICE OF THE DEPUTY ATTORNEY GENERAL,
Washington, D.C., March 28, 1961.

HON. OREN HARRIS
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in response to your request for the views of the Department of Justice on H.R. 2446, a bill to provide that hydraulic brake fluid sold or shipped in commerce for use in motor vehicles shall meet certain specifications prescribed by the Secretary of Commerce.

The bill would require the Secretary of Commerce to prescribe and publish specifications for hydraulic brake fluids for use in motor vehicles so as to "provide the public with safe and efficient hydraulic fluids for motor vehicle hydraulic braking systems in order to promote highway safety." The importation, sale, manufacture or transportation in commerce of fluid which does not meet such specifications would be unlawful and punishable by a fine of up to \$1,000 and imprisonment of up to 1 year.

The Department does not have any knowledge of the need for such legislation. In any event the bill would make criminal acts which are of innocent character. For example, the words "transportation or causing to be transported in commerce" would include such persons as common carriers and the

consumer who ordered the proscribed fluid and thereby causes it to be transported to him. The Department cannot endorse a criminal penalty drafted so as to reach parties who without intent violate the law. Accordingly, the Department is unable to recommend enactment of this legislation.

The Bureau of the Budget has advised that there is no objection to the submission of this report from the standpoint of the administration's program.

Sincerely yours,

JOSEPH F. DOLAN,
Assistant Deputy Attorney General.

Mr. ROBERTS. This legislation was introduced August 18, 1960, as H.R. 13038 but the 86th Congress adjourned before the bill could be considered.

Introduction of this legislation directly resulted from an article in *Automotive News* for August 15, 1960, which pointed out that Chrysler Corp. engineers had found that 28 percent of the brake fluids marketed in the Detroit area were substandard.

It is easily seen that every vehicle with brakes depending on substandard hydraulic fluid is a deadly menace, not only to the occupants of that automobile but to other traffic and to pedestrians.

Some may say that legislation to keep substandard brakefluid off the market is a responsibility of the States. To this, I would be the first to agree. But less than half the States have legislation adequate to meet this situation. A person starting out from Washington on a trip across the country just would not know where he could stop to get brake fluid that is adequate and safe. If the States fail to act, the Federal Government has some responsibility to protect interstate commerce from the hazards resulting from this phantom killer of substandard brake fluid.

This is not a problem that had developed in recent months. It has been with us a long time. Back in 1953, a member of the legislature in Minnesota finding that some of the many automobile accidents attributed to brake failure of an undetermined cause were probably due to low-boiling brake fluids, succeeded in getting legislation enacted on the subject.

So we have been working on the problem at least since 1953 and still less than half the States have effective legislation to protect the public from this phantom killer.

If there is no objection, I want to insert in the record at this point the article from *Automotive News*.

(The article from *Automotive News* is as follows:)

BRAKE FLUID DANGER

Potential death still stalks the Nation's highways in the form of substandard brake fluids, even though 27 States and the District of Columbia have passed legislation aimed at preventing the sale of such products.

In a recent test, Chrysler Corp. engineers found that 28 percent of the brands of brake fluid being marketed in the Detroit area were substandard and that these substandard fluids are "even worse than they were 5 years ago."

Of the 75 brands of commercial brake fluid tested, 15 were found to be so substandard that they would not qualify under any Society of Automotive Engineers rating formula, and 6 brands were of the "moderate" type or of SAE 70R2 which in most of today's high-engine-output cars are considered to have a boiling point below a safe factor.

Despite the fact that 15 brands were definitely substandard and did not meet any SAE specifications (compared with 23 such brands 5 years ago), the quality of the substandard brands tested was considerably below that of the same brands of the earlier period. Five years ago these substandard brands boiled at an average temperature of 181° F., while today's purely substandard brands boil at 179°.

Five years ago, the 23 moderate-duty brands boiled at an average of 245.5°, while the 6 moderate-duty brands tested this year boiled at an average of 258°, showing an improvement in their quality.

Today, it is considered that a safe brake fluid should withstand temperatures up to at least 300°, and with the larger, more powerful cars, fluids should be able to remain constant at 350°.

The insidious thing about these substandard fluids is that they are not only "phantom killers" in themselves, but when they are added to the 54 brands that do meet SAE heavy-duty or super-heavy-duty specifications, they tend to lower the top boiling point of the safe fluid that is in the car and make it unsafe.

PHANTOM KILLERS

The phrase "phantom" or "vanishing" killers is used in connection with these substandard brands because, while they vaporize under hard stopping conditions, by the time the car is investigated as to the cause of an accident, the brakes have cooled and the vapor returns to its fluid state and the brakes will work again.

Engineers like Charles M. Heinen, assistant chief engineer of materials laboratories for Chrysler Corp., and F. J. Markey, sales engineer of the Delco Moraine Division of General Motors, who are working to develop safer brakes, realize the extreme danger in allowing these substandard brands of fluids to be marketed, although they admit that they have no proven figures on the number of fatal accidents caused by brake failure due to substandard fluids and contributing factors.

Another insidious potential "killer" is found in the cars equipped with the modern foot-applied parking brake that acts on the rear wheels but has no warning light or other means except the release lever that is almost completely hidden under the dash to warn the driver that his parking brake may be partly applied.

Approximately 58 percent of the cars sold this year are equipped with this type of brake and were sold with no warning light to let the driver know when he was driving with his brake partially on.

A recent near accident drives home the dangerous situation that can develop under this condition. In this case, a car that had no warning light was driven at normal expressway speeds with one brake shoe held partially on by the parking brake.

This developed so much heat that it not only caused a failure in the brake, entire loss of brake fluid and entire loss of braking ability but it also blueed the metal part of the shoes on that brake.

Under this high heat condition, the brake cylinder cup has a natural tendency to reform and lose the flare that holds it against the brake cylinder. This allows the fluid to gush out of the system. When the cup cools it also shrinks in diameter, it is claimed.

There seems to be no question that vaporization of the fluid also takes place regardless of the quality of the fluid in the system. The only reaction to subnormal fluids under this condition would be that the brake would fail sooner and under much less heat.

In addition to the rubber cylinder cup in the brake cylinder, some makers use metal expanders which will keep the cups from losing their flare and shrinking under high heat longer than the assemblies where only the rubber cup is used. Thus, in a sense, these metal expanders can prevent many accidents of this type.

Since they cost a few cents per wheel, some vehicle companies and many service stations do not put them in the brake cylinder either as original equipment or in brake repair procedures.

MOUNTAIN PROBLEM

The terrible thing about brake-fluid failure is that unless a leak develops in the system, cars normally operate at brake-cylinder temperatures of 158° to 250° under hard driving. But the high heat that makes them killers develops under conditions when the brakes are needed the most.

Coming down a long hill with the brakes on can generate as much as 600° of heat surrounding the brake cylinders, engineers say, and a dragging parking brake can develop 700° or more. Even the master cylinder is located in the engine compartment where temperatures of 300° are not uncommon on hot days and in stop-and-go driving.

Safeguards for mountain driving are giving brake engineers great concern in today's cars with their hothouse wheel compartments. And the problem is becoming more acute as the size of the wheels is reduced.

The day may come soon when present brake linings and hydraulic brake parts may not be able to stand the tremendous heat that is developed.

Currently, however, the problem is centered around areas of mountain driving where, for instance, every 1,000 feet of elevation contracts the volume of the fluid and lowers its boiling point from that of sea level.

Another problem is rush-hour expressway driving where the continual stop-and-go driving acts as a heat-soaking agent and allows cylinder temperatures to climb.

According to Chrysler engineers, the quality of heavy-duty SAE 70R1 type brake fluids is alarming. Several of the commercial SAE 70R1 designated brake fluids tested will not conform to SAE specifications, and a number of others are borderline.

Since only a limited amount of specification testing has been done to date, it would seem that a high percentage of trade name brake fluids designated as SAE 70R1 type are illegally labeled.

Chrysler engineers have not completed their tests on type 70R3 heavy-duty fluid, but it is indicated that there is some cheating going on by some makers of even this highest type fluid.

While 27 States and the District of Columbia now have brake fluid legislation permitting the sale of only SEA 70R type brake fluids, only 10 States require registration and certification that individual brake fluids conform to the minimum SAE standards. Many States which do not require registration do not designate any enforcement department or agency.

Since certain less-reputable manufacturers of hydraulic brake fluids can operate in these States with minimum risks, it is apparent that the illegal use of the SAE 70R1 type designation could be harmful or damaging to the SAE, to the driving public and to the dealers who sold the illegally marked fluid in the belief that they were selling a safe, high-test heavy-duty fluid.

MANY SUBSTANDARD BRANDS

Chrysler engineers found that while a few SAE 70R3 type fluids have borderline boiling points, eight trade-name fluids have boiling points above 400°.

While there has been an apparent reduction in the number of individual brands of substandard and moderate-duty brake fluids sold in the Detroit market, the availability of these undesirable fluids is more extensive than the actual percentage of these fluids purchased.

This is illustrated by the following table of the types of brake fluids sold by all retail outlets contacted during this survey:

Retail outlet	Substand- ard	SAE 70R2	SAE 70R1	SAE 70R3
Major gasoline stations.....	14	2	50	24
Independent gas stations.....	7	1	8	2
Auto accessory stores.....	68	41	104	43
Franchised car dealers.....	0	0	3	5

Although 27 States and the District of Columbia have enacted legislation to protect motorists from substandard brake fluid, only 10 States have put sufficient teeth in their legislation to prevent the marketing of spurious products.

In the interest of safety, this Nation should have legislation that will adequately protect the owners of cars and trucks against being sold any of these substandard brake fluids.

And every State that now has such legislation should put sufficient teeth in their laws to prevent the unscrupulous from marketing their spurious products.

Dealers should take every precaution to make certain that their source of brake fluid is reliable and that each package is plainly labeled as to its SAE rating.

STATES WHICH GOVERN BRAKE FLUID

1. Alaska.	11. Maine.	21. Texas.
2. Alabama.	12. Minnesota.	22. Virginia.
3. Arkansas.	13. Mississippi.	23. Wisconsin.
4. California.	14. New Jersey.	24. Rhode Island.
5. Connecticut.	15. New York.	25. Massachusetts.
6. Delaware.	16. North Carolina.	26. Kentucky. ¹
7. District of Columbia.	17. Oklahoma.	27. Arizona. ²
8. Florida.	18. Pennsylvania.	28. Michigan. ³
9. Georgia.	19. South Carolina.	
10. Louisiana.	20. Tennessee.	

¹ Sept. 1, 1960.² Sept. 24, 1960.³ Jan. 1, 1960.

Mr. ROBERTS. Our first witness today is Mr. Charles Prisk, Bureau of Public Roads, Department of Commerce, Washington, D.C.

**STATEMENT OF CHARLES PRISK, BUREAU OF PUBLIC ROADS,
DEPARTMENT OF COMMERCE**

Mr. PRISK. Mr. Chairman, gentlemen, it is a privilege to appear before your committee today to present the report of the Department of Commerce on H.R. 2446.

This bill would require the Secretary of Commerce, within 90 days after its enactment, to prescribe and publish in the Federal Register, specifications for hydraulic brake fluid sold or shipped in commerce for use in motor vehicles. Thereafter a transaction in commerce involving brake fluid which does not meet these specifications would be unlawful, and punishable by fine or imprisonment, or both.

It is our understanding that the General Services Administration has issued specifications with respect to brake fluids which are applicable to Government-owned vehicles. Also, 27 States and the District of Columbia have imposed regulations relating to the marketing of inferior brake fluids.

This Department is certainly sympathetic with the safety objectives contemplated by H.R. 2446. However, we would also emphasize that the several States have traditionally exercised regulatory authority over motor vehicle safety features; and it would seem that the entry of the Federal Government into the field of brake fluid standards regulation presents the basic question of the proper role of the Federal Government generally in the regulation of motor vehicle equipment.

We would like to suggest that it might be helpful for the President's Commission on Intergovernmental Relations to give careful study to the basic question of the Federal Government's role in the regulation of motor vehicle equipment, before decision is made with respect to brake fluid standards. It will be observed that the views expressed above are consistent with our comments on H.R. 903, which deals with additional aspects of safety equipment on motor vehicles.

In any event, we believe that if the bill in question is enacted into law, a minimum of at least 180 days should be allowed for preparation and publication of specifications. Also, the bill should require the labeling of brake fluids as conforming to the specifications to be promulgated.

This concludes the Department's report.

Mr. ROBERTS. Mr. Prisk, you know I have had a good deal of experience with departmental reports. This is not the first time that I have been confronted with the reluctance of the Commerce Department to go along with safety regulations. I had that experience with them in the refrigerator safety bill. We were never able to get them to give us a favorable report.

I am not fussing at you, because I know you are here because you are sent here. But I would like to ask you what good you think that this recommendation would do, to refer this to another commission. I have not ever been impressed by too many of these Presidential commissions as far as getting anything done.

Now, what is your opinion of the effectiveness of referring this to the President's Commission on Intergovernmental Relations?

Mr. PRISK. The President's Commission on Intergovernmental Relations, of course, covers a very wide body of interests, from my knowledge of their operations and reports that have been issued. I think that there has been some important headway made in contribution in terms of separation of regulatory authority over matters between the various levels of government.

This particular type of subject matter, having been dealt with by as many State laws as is indicated, having been dealt with by the Uniform Vehicle Code in its specific section, 12205, and having been dealt with by the Society of Automotive Engineers, it seems to me that we can reflect that progress is being made in this area, and whether the intervention of Federal authority would be helpful or not I think is still questionable.

This is, I think, the background of reasoning for a referral possibly to this Commission.

Mr. ROBERTS. Well, don't you think that Federal control of unsafe food and drugs has worked pretty well for over half a century?

Mr. PRISK. I would say this is right. I think that State control has worked quite well in the field of motor vehicle regulation, also.

Mr. ROBERTS. You mentioned the role of the SAE. Isn't it true that the Society of Automotive Engineers has already been in the field for many years and has already set up certain specifications for safe brake fluid, and they have been published throughout the industry?

Mr. PRISK. Yes, they have.

Mr. ROBERTS. And yet would you know, if you went to a filling station, went to ask for—what SAE specification to ask for?

Mr. PRISK. No, I would not.

Mr. ROBERTS. Do you think the average motorist would know whether he was getting buttermilk or safe brake fluid, actually?

Mr. PRISK. I suspect not.

Mr. ROBERTS. And isn't that the reason that right in the Detroit area, according to the Chrysler people, that they found that there were 14 major gasoline stations selling substandard brake fluid?

Mr. PRISK. This I have no personal knowledge of, and would hesitate to comment on that particular survey. I do think that the incidents of inferior brake fluid in terms of its appearance as an accident factor has been insignificantly low.

Mr. ROBERTS. But as a matter of fact, if one death results from the use of unsafe brake fluid, isn't that one death too many?

Mr. PRISK. It certainly is.

Mr. ROBERTS. Now, I notice that in this article, that there were independent gas stations—there were seven selling substandard fluid. The auto accessory stores, there were 68 selling it. I believe the franchise car dealers had a pretty good record—none of them were selling substandard brake fluid, according to this article.

Doesn't it seem to you that it would be much easier for the Federal Government to prevent this from ever getting into interstate commerce than it will be for the substandard lots to be broadcast throughout the Union, and then for these States to have to go around and test all of them?

Mr. PRISK. This I think is a question that is open to debate. It is not quite the same as a safety lock on a refrigerator door, or another obvious feature of design. Safety brake fluid, to the average motorist, is something that cannot be distinguished as it is put into your car, just as you mentioned earlier.

Mr. ROBERTS. Going back to your statement that it was your opinion that an insignificant number of deaths were actually caused by the use of substandard fluid—upon what information do you base that statement?

Mr. PRISK. Intensive analysis of accident studies at Northwestern University which were conducted as a part of our highway safety study, plus other information that comes to us in our research program on traffic accident studies.

Mr. ROBERTS. Now, do you know if anyone keeps accurate statistics on this type of accident for every State in the Union?

Mr. PRISK. Brake failures are usually identified, to the extent that they can be detected after the accident. This itself is very difficult. Once a brake failure is identified as a factor in the accident, you still have the problem of determining whether it is a failure of the fluid or a failure of the mechanism in the system. And this, after an accident, is exceptionally difficult.

Mr. ROBERTS. Well, as a matter of fact, it is not true that in this whole field of highway safety that we are dealing many times with very inaccurate examination of accidents?

Mr. PRISK. As far as some of the studies are concerned, this is correct, certainly.

Mr. ROBERTS. I have been in the field now for about 6 or 7 years, and that has certainly been my experience—that if there is anything that is lacking in the entire picture, it is the fact that we know so little about it—actually what has caused an accident. That is why I say I think your statement that the number is insignificant may not be based on the best information.

Mr. PRISK. This is only my judgment.

Mr. ROBERTS. Yes, sir. That would be your own personal opinion. That is all.

Mr. NELSEN. No questions.

Mr. ROGERS of Florida. Mr. Prisk, I am sorry that I was a few minutes late. Did you have a prepared statement?

Mr. PRISK. A report from the Department, yes.

Mr. ROGERS of Florida. And has this been your field in the Department of Commerce—safety?

Mr. PRISK. Yes.

Mr. ROGERS of Florida. And how long have you been working in the Department on this field, Mr. Prisk?

Mr. PRISK. Since 1939.

Mr. ROGERS of Florida. What are the major recommendations that you can recall—I am not asking for small recommendations—but major recommendations that you, in your work, or in the Department, have come forth with to improve safety on the automobile safety problem?

Mr. PRISK. Well, our work has been, I think I would say, very largely with commercial vehicles, since the problems of size and weight are extremely closely associated with highway design and roadbuilding, which of course is a major function of our agency. And the recommendations that have come forward have been ones resulting from research on braking requirements, those resulting in the recommendations for size and weight of vehicles as they now exist. I would say these perhaps are principal among the ones that have been made.

Mr. ROGERS of Florida. Yes. Would you tell me just a little bit about your setup as far as the safety division of the Bureau of Public Roads is concerned. Is there such? I was just asking for my own information. Could you tell me a little bit of your work and how many people you have working on this problem of safety? Also, is there a special division or not?

Mr. PRISK. There is widespread concern with safety throughout the Bureau of Public Roads. I think that it would be difficult to separate this out. Organizationally, my position is as Special Assistant to the Assistant Commissioner for Research, Mr. Holmes, who is in charge of all of our research program.

In our research program, in the Bureau of Public Roads, the division of work which I am most familiar with, we spend somewhere in the neighborhood of \$2.5 to \$3 million each year on work which is safety associated, to say the least.

Mr. ROGERS of Florida. But you do not have any specific division or any specific group devoting all of their time and energy to the problem of safety as such.

Mr. PRISK. We have a Traffic and Safety Branch in our Operations Division; yes, sir. So this group is devoting its full concern, you might say, to that problem.

Mr. ROGERS of Florida. And how long has that been established, do you recall?

Mr. PRISK. The Traffic and Safety Branch is of relatively recent origin—perhaps 2 or 3 years.

Mr. ROGERS of Florida. What major recommendations have been made that you know about along the safety improvement line?

Mr. PRISK. I would say that the principal recommendations are things that are related very largely to highway signing, marking, use of traffic control devices—not very much things on the vehicles at the present time, although we do have three projects that are currently active dealing expressly with the vehicle in terms of communication between drivers on the highway as provided through vehicle equipment.

Mr. ROGERS of Florida. What research, if any, has been done on this problem of brake fluid within your group that you know of?

Mr. PRISK. No, sir.

Mr. ROGERS of Florida. Not at all?

Mr. PRISK. There has been none.

Mr. ROGERS of Florida. Do you think there is sufficient personnel and sufficient emphasis being placed by the Department on the safety program?

Mr. PRISK. I think that steps are underway to increase the emphasis of the Department on highway safety program. I do not think that we are satisfied at all with present activities in the highway safety field. I believe this extends throughout the organization pretty much.

Mr. ROGERS of Florida. Well, I am concerned—My first reaction, and I have not gone into this subject thoroughly—but I think the committee ought to, Mr. Chairman, is concerned with how little effort and how little, it seems to me, imagination in this field of safety has come forth from the Bureau of Public Roads. I think some emphasis needs to be placed on this field. If this is not a group that is competent to do it, or they do not feel they are competent to make positive recommendations, rather than to keep referring it to other agencies, perhaps we should consider taking the jurisdiction away and setting up a specific group to go into safety. With as many deaths as we have in America today on highway accidents, it seems to me this is a very major field for us to put some real effort and some imagination into and produce some recommendations that can help cut down this tremendous death toll. I do not think we are doing it. I am concerned when the Bureau comes up here without any research on this problem and still says that only 27 States and the District of Columbia have any regulations relating to the marketing of inferior brake fluid. It further concerns me that all we do is say, "Well, let's refer it to some other governmental committee."

I am not very well pleased with the attitude of the Department of Commerce. In fact, I am surprised. I hope that the committee will hold hearings on this problem. I feel this is a real major problem in America today. I do not know of anything that causes more deaths, yet could be stopped if we took proper actions. I just hope that the Department will put more emphasis on this problem, devote a little time to more research, and more effort for recommendations to improve safety features in the highway program.

Mr. ROBERTS. The Chairman could not agree with the gentleman from Florida more. I am getting tired of introducing bills and holding hearings on safety matters. This is certainly not a far-reaching bill. But it is a bill that can save a lot of lives. And when the Department continually comes up here and recommends against a very small step in the direction of the safety of our people on the highways, roads, and streets of this country, it seems to me that certainly we ought to investigate and find out what is wrong with the Department of Commerce.

I have had this same experience. I had it with them in the refrigerator safety bill. We could get no cooperation. They constantly opposed every effort the Congress made for safety in that field.

I am certainly going to do my best to see that we find out what goes on down there and find out if we can produce at least one bill that they will go along with.

I think it is time that we find out what is responsible for this attitude, why it is that we must constantly beat them over the head to get even a favorable report on anything.

I, for one, am very much displeased with the Department's attitude. I am not going to be satisfied with it until we find out what is happening down at the Department level.

Mr. PRISK. Mr. Chairman, might I say that the Bureau of Public Roads, as a constituent agency of the Department, is essentially a roadbuilding agency. The work and activity that relates to highway safety has necessarily been focused primarily on the highway, because these are the disciplines that reside very largely in our organization.

We have made extreme contributions, we feel, to highway safety through improvement and refinement of highway design, and I think this is a matter of record, that one-half to two-thirds of the accidents and fatalities are eliminated by reason of the controlled access principle and the other features that are associated with modern freeway design. This is our speciality. We feel that tremendous strides have been made in that area.

We are not specialists on the vehicle, except as it relates to the highway. This particular field we are working with more and more as time permits. But we are a roadbuilding agency.

I think that the principle representation I would make is in the pages of our study of the Federal role in highway safety, a report filed by the Secretary of Commerce in March of 1959, which I am sure you are aware of. In that report, we review the contributions and activities of the Department of Commerce and other Federal departments throughout this entire field.

Mr. ROBERTS. I say to the witness that the Chair remembers that report very well, having studied it for many hours. I think that report cost the Federal Government around \$200,000. And then last year, after having made certain safety recommendations, the Department then came around, when we had H.R. 1341, which provides for minimum standards on Government-owned vehicles—they came up and reported against that bill. So I say I doubt if you know which direction you are going in down there. You move one day in the direction of safety, and the next day you are going the other way, another direction.

I agree with the gentlemen from Florida that I think this committee ought to find out just what you believe in down there, and find out some way if we can get some consistency down there in the Department opinions about legislation.

Mr. ROGERS of Florida. Mr. Chairman, I want to say, too, that I think probably you have pointed up some of the problem and difficulty which I think we should look into. The fact is that all of the emphasis, or the main emphasis, which is probably correct, was placed on road design and so forth in the Bureau of Roads. Therefore, you have not had an active group trying to do something about safety as far as the automobile itself is concerned. I can understand perhaps, that the main emphasis has been placed on roadbuilding and design, which you felt was more in your line. And that is what really concerns me. Here is a problem that much could be done on, I am sure, if we had a proper group working on the problem within the Department of

Commerce, if that is the proper agency where we should locate it. I think you pointed that up. That is the problem I hope this committee can get into.

Mr. ROBERTS. Mr. Thomson.

Mr. THOMSON. No questions.

Mr. ROBERTS. Thank you, Mr. Prisk.

Our next witness this morning is Mr. Kibbee, of the American Trucking Associations.

**STATEMENT OF LEWIS C. KIBBEE, DIRECTOR, ENGINEERING
DEPARTMENT, AMERICAN TRUCKING ASSOCIATIONS, INC.**

Mr. KIBBEE. Mr. Chairman, members of the subcommittee, my name is Lewis C. Kibbee. I am presently director of the engineering department of the American Trucking Associations. I have been employed in this or similar capacities for that association since 1949. I am a graduate engineer, and have been employed in truck engineering since 1943, as well as being a registered professional engineer in the District of Columbia. In my work I have represented American Trucking Associations on national technical committees working on vehicle braking in the National Committee on Uniform Traffic Laws and Ordinances, the Interstate Commerce Commission, the Society of Automotive Engineers, the U.S. Bureau of Public Roads, the American Standards Association, and other national organizations. I am therefore familiar with truck brake engineering practice.

American Trucking Associations, Inc., whom I represent here today, is a national federation of State trucking associations representing all forms of truck transportation, both private and for-hire. It is the national trade association of the trucking industry with officers at 1616 P Street NW., Washington, D.C.

My appearance here is in relation to H.R. 2446, which bill would prescribe specifications for motor vehicle hydraulic brake fluid, including that used in motortrucks, to be established by the Secretary of Commerce.

We do not oppose the intent of this bill, which seeks to outlaw substandard brake fluid, but we feel that the bill as written could prove to be most confusing and should therefore be amended.

A review of the requirements for brake fluid in the States indicates that five States use the wording of the uniform code to specify brake fluid to be used in their States. These States are: Connecticut, Delaware, Georgia, Pennsylvania, and Virginia.

Having heard the chairman's remarks, maybe you are more familiar with this than I am, but I know that these States do work in this area.

With this fact in mind, let us review the requirements of the uniform code relating to brake fluid. Section 12-305 of the code, titled "Hydraulic Brake Fluid," in paragraph (c) says:

The (department or official) shall, after public hearing following due notice, adopt and enforce regulations for the administration of this section, and shall adopt and publish standards and specifications for hydraulic brake fluid which shall correlate with, and so far as practicable conform to, the then current standards and specifications of the Society of Automotive Engineers applicable to such fluid.

This means that indirectly these five States have adopted the Society of Automotive Engineers specification for brake fluid. Four more

States, Mississippi, Wisconsin, Oklahoma, and South Carolina, have regulations saying that brake fluid sold in those States must be at least as good as that conforming to SAE specification 70-R-1, without using the uniform code language. Alaska says that "heavy duty" brake fluid must be used in that State. The States of Arkansas, California, Florida, Louisiana, New Jersey, and Tennessee require fluid at least as good as that specified in the SAE standard. Maine uses the uniform code wording with minor modification, but allows the administrator to have requirements kept current with the SAE standards.

To say this another way, 17 States have on their books regulations that specify brake fluid in terms of the SAE standard. We therefore feel that if the Federal Government is to specify requirements for brake fluid, these requirements should be specific and in terms of the same standard, rather than in the general terms of H.R. 2446.

We would therefore suggest that on page 1 of this bill, on line 4, after the word "shall", strike out the rest of the paragraph down to line 10 and insert in lieu thereof the following:

* * *, after public hearing following due notice, adopt and enforce regulations for the administration of this act and shall adopt and publish in the Federal Register standards and specifications for hydraulic brake fluid which shall correlate with, and so far as practicable conform to, the then current standards and specifications of the Society of Automotive Engineers applicable to such fluid.

The adoption of this wording would not be in conflict with the laws of the 17 States cited above, and would effectively rule out the use of substandard brake fluid. At the same time it would give the Secretary of Commerce a clear direction that it is the intent of this committee not to conflict with recognized engineering standards already in effect not only in the States but throughout the automotive manufacturing and user groups. The possibility of the Secretary of Commerce adopting conflicting regulations to those in the States should be avoided, and we feel this is best done by clear language in the bill giving him direction. That is why we suggest the above wording, very similar to that found in the uniform code.

One other minor item in relation to H.R. 2446, which has nothing to do with the technical details of the fluid, gives us, that is, the trucking industry, some concern. That is the fines and penalties for the transportation or delivery of brake fluid that does not meet the specifications to be adopted. Again we agree with the intent but feel that the wording should be amended to read the "knowing and willful" delivery or transportation of substandard fluid should be punishable. At the same time the committee will recognize that a motor carrier might become involved in the transportation of substandard brake fluid without his knowledge if it is tendered as a shipment in the regular line of business. He has a real problem. He may not know what is in the box and transport it in good faith.

If no evidence is found to indicate that a carrier is knowingly and willfully involved in this transportation, we do not feel that the penalties should apply. This is common language incorporated in other laws involving the transportation of illegal materials, such as slot machines, pornographic materials, narcotics, and so forth. We would ask for the inclusion of such "knowingly and willfully" language with regard to the transportation of brake fluid not meeting the specifications which may be adopted.

If these two changes requested above could be incorporated into the amended bill, we would have no objections to the other provisions.

Mr. ROBERTS. Thank you, Mr. Kibbee. I appreciate your statement. I certainly think that the changes which you suggest are reasonable, and that we would not want to do anything in this committee to interfere with the laws that have already been adopted by the States in this field. I think that your suggestions are good and that we should give consideration to incorporating those suggestions in another draft of the bill.

I will again thank you for your appearance here.

I have no further questions.

Mr. NELSEN. No questions.

Mr. THOMPSON. No questions.

Mr. ROGERS of Florida. I just want to say, Mr. Kibbee, I think your suggestions are good, too, and we appreciate your appearing and making them.

I just wonder generally if you feel it wise to have some minimum safety factor on the use of brake fluid?

Mr. KIBBEE. We certainly agree with you, sir; yes, sir. This is widespread in the adoption of SAE standards.

Mr. ROGERS of Florida. And do you have any facts that you might make available to the committee for inclusion in the record as to accidents caused in the trucking industry, say, because of inferior braking fluid? Would you have any information of that type?

Mr. KIBBEE. I do not think we would statistically. We have, of course—engineeringwise we know that not only does this cause a mechanical failure, but poor brake fluid is a poor lubricant, and this is expensive. You wear out an expensive brake system needlessly. So we feel that a dollar spent on good brake fluid is \$2 earned in not wearing out your brake equipment. We just look at it as a business expense, too.

Mr. ROGERS of Florida. I suppose your major trucklines insist on proper brake fluid.

Mr. KIBBEE. Yes sir, we certainly do. Even in SAE there are two categories of brake fluid. One is basically a passenger car fluid, and the other is a heavy-duty truck fluid. We usually specify the 7-OR3, which is the heavy-duty fluid.

Mr. ROGERS of Florida. Thank you very much. Thank you, Mr. Chairman.

Mr. ROBERTS. Thank you.

At this time, without objection, I would like to put into the record a letter from Gen. George C. Stewart, executive vice president of the National Safety Council, Chicago, regarding this legislation, in which he encloses a release from the Society of Automotive Engineers on the subject copy of an article regarding the SAE committee report.

I will just read the letter.

This is addressed to me as chairman, dated March 15, 1961.

DEAR CONGRESSMAN: Thank you for your letter of March 10, 1961, and the copy of your proposed H.R. 2446 to establish safety standards for hydraulic brake fluid.

The National Safety Council relies largely on the Uniform Vehicle Code for guidance in this area of traffic legislation. The control of hydraulic brake fluid for motor vehicle use, code section "12-305—Hydraulic Brake Fluid" is our guide. Under subsection (c) it adopts the current standards and specifications of the Society of Automotive Engineers applicable to such fluid.

I am enclosing for your study a copy of a SAE brake committee report and a release from the Society of Automotive Engineers on the subject.

Certainly any Federal legislation on hydraulic brake fluid for motor vehicles which is consistent with uniform code provisions would merit our support.

Many thanks for all your efforts in behalf of traffic safety, and please call upon us if we can assist.

Sincerely,

G. C. STEWART, *Executive Vice President.*

(The documents referred to follows:)

SOME BRAKE FLUIDS UNSAFE FOR MODERN CARS SAY AUTOMOTIVE ENGINEERS

The Society of Automotive Engineers announced today that only heavy-duty brake fluids are safe in most 1955, 1956, and 1957 model cars. In order to assure highway safety the SAE has withdrawn its approval of moderate-duty brake fluids, now considered dangerous for bigger, more powerful cars of recent vintage.

SAE tests show that a 1957 car weighing 4,000 pounds stopped repeatedly at high speeds may generate fluid temperatures of 250° or greater. At this temperature brakes with moderate-duty fluids can fail. SAE specification 70-R-2 sets the minimum boiling for moderate-duty fluid at 235°.

The significance of a brake fluid's boiling point lies in the fact that hydraulic brake systems fail when the fluid begins to turn to gas as it boils. Gases, unlike fluids, can be compressed. Thus even a small amount of gas in a brake system acts as a "cushion" and prevents transmission of pressure from foot to brake shoe. Failure is generally total.

Higher brake fluid temperatures occur more frequently today because of changes in auto design. Among these are: the change from open wheels to solid disks, smaller wheels, and wider rims and tires; the placing of brakes completely inside the wheel; lowering and streamlining of bodies and fender skirts; the use of heat-resistant brake linings; automatic transmissions; more weight and power; and the installation of heat-generating equipment such as power steering and power brakes.

Although all new cars have heavy-duty brake fluid in them on delivery, it is possible that a serviceman may add moderate-duty or other fluid to the system. This can dangerously lower the boiling point of all the fluid in the system. SAE tests showed that only a very small quantity of substandard fluid can lower the boiling point of a heavy-duty fluid by as much as 80°.

On a hot day brakes may fail between traffic lights after heavy stop-and-go driving. During the time between brake applications heat is transferred from brake drum to fluid causing boiling and failure without warning. This ghastly circumstance is known as phantom failure.

Another type of phantom failure follows the boiling of brake fluid in the master cylinder due to high temperature in the engine. This means that a driver may have an unforeseen brake failure after driving many miles without once applying the brakes.

Recognition of the danger of moderate-duty and substandard brake fluids has led to legislation in eight States forbidding the sale of fluids that fail to meet SAE 70-R-1 heavy-duty specification. The States are: Minnesota, Georgia, California, New Jersey, North Carolina, South Carolina, Arkansas, and Tennessee. The SAE's withdrawal of its 70-R-2 moderate duty specification is expected to guide other legislatures now studying brake fluid regulations.

When the SAE's heavy duty specifications were first set forth at the end of World War II, they were intended largely for trucks. Now many trucks are engaged in such rugged hauling that the SAE is presently developing a new specification for truck brake fluids with a minimum boiling point above 300°.

The Society of Automotive Engineers is a professional engineering organization formed in 1905 to establish standards in the automotive industry. Its specifications are widely recognized and accepted throughout the automotive industry.

SAE BRAKE COMMITTEE SAYS HEAVY-DUTY FLUID NECESSARY FOR SAFE BRAKING OF MODERN CARS

A critical car safety problem worrying automotive engineers, highway authorities, police bureaus, and other safety-conscious groups is the hazard of substandard brake fluids. To date only 13 States have legislated against the sale of substandard brake fluids. And the individual motorist, by and large, is ignorant of the whole subject.

The reason for concern is this: Braking bigger, more powerful cars, equipped with solid wheel disks, automatic transmissions, and other heat-generating or heat-confining design features, can raise brake fluid temperatures above the boiling point of all but heavy-duty brake fluids. When the fluids boil, the hydraulic system fails. Vapor in the hydraulic system acts as a cushion, preventing transmission of pressure from the driver's foot to the brake shoe. Thus, the brakes don't work.

Fluids that once were satisfactory are no longer safe due to changes in automobile design. Modern cars demand modern brake fluids. In 1957, the Society of Automotive Engineers (SAE) withdrew its specifications for "moderate-duty" brake fluids because these fluids are dangerous for the more powerful cars of recent vintage. The SAE specification for moderate-duty fluids set the minimum boiling point at 235° F. But in a series of road tests, it was shown, for example, that a typical 1957 car weighing 4,000 pounds, stopped repeatedly at high speeds, can generate a brake fluid temperature of 250° F. or greater. As a result, the minimum boiling point now considered safe is 300° F. and only the SAE 70-R-1 specification heavy-duty brake fluid meets this requirement.

An SAE committee of experienced engineers and chemists has followed the development of hydrolube brakes and brake fluids since it was established back in 1945. Over the years, the brake fluid committee has studied changes in car design, brake design, and driving habits, along with reports on actual brake operations, and these men have noted an increase in brake temperatures.

Changing from open wheels to solid disk type, reducing wheel size, increasing width of rims and tires, placing brake completely inside wheel, lowering and streamlining the bodies, adding fender skirts, improving heat resistance of brake linings, adoption of automatic transmissions, and increasing the weight of the cars, are some of the modern design changes that have helped raise brake fluid temperatures. Recently, greatly increased horsepower, coupled with new automatic transmissions and still smaller wheels and brakes, have made a sharp upturn in maximum brake operating temperatures.

Automobile manufacturers are aware of the need for heavy-duty fluids and all new cars contain heavy-duty brake fluid when they leave the factory. This year, one major manufacturer's cars and trucks will use an all new brake fluid designated for extra heavy-duty braking and heat resistance. The fluid has a minimum boiling point of 390° F. The company's engineers claim the fluid will tend to lessen the danger of brake failure.

However, the danger is this: a serviceman may put a small amount of a substandard type fluid into a system and dangerously lower the boiling point of the entire system. Only a very small quantity of substandard fluid, for example, can lower the boiling point of heavy-duty fluid by as much as 80°.

The first State to take action in this field was Minnesota which, in 1953, passed a law prohibiting the sale of all but heavy-duty brake fluids. New Jersey followed in 1954, and Tennessee in 1955. Since then 10 other States—California, North Carolina, South Carolina, Arkansas, Texas, Oklahoma, Mississippi, Georgia, Pennsylvania, and Virginia—have passed laws regulating the sale of hydraulic brake fluids. Several States including Alabama, Arizona, Delaware, Florida, Kansas, Louisiana, Massachusetts, and Michigan have considered regulations but these States, and the remaining 27 States, have not as yet outlawed dangerous substandard brake fluids.—Brake and Front End Service, July 1958.

Mr. ROBERTS. I would also like to place in the record a letter from Mr. Paul C. Ackerman, vice president-engineering of the Chrysler Corp., regarding the brake fluid survey made by Chrysler, together with a copy of the report on the survey dated December 30, 1960.

I would like, without objection, to read his letter and include the report in the record.

This is dated March 20, 1961, addressed to the chairman.

Thank you for sending us a copy of your bill, H.R. 2446 to establish safety standards for brake fluid.

The information contained in the Automotive News article to which you referred was based in part upon preliminary results of a Detroit area field study being carried out by Chrysler Corp. Since that time, our study was completed and summarized in a report to the Subcommittee on Hydraulic Brake Fluids of the Society of Automotive Engineers, Inc. A copy of this report is attached.

The results of this study showed that, while a very encouraging improvement had been made in the brake fluids sold to the motoring public in the Detroit area, a number of unsatisfactory fluids were still being offered. It should be noted that a Michigan law covering brake fluids did not become effective until January 1, 1961, and was therefore not in force at the time of our survey.

Chrysler Corp. has actively participated in industry efforts to promote regulation in the various States to insure that only brake fluids with adequate safety factors are sold. In each case, we have strongly advised that any legislation incorporate a reference to standards of nationally recognized technical societies, such as the SAE, so that uniformity is maintained and the very latest and best technical practice is reflected in the adopted regulations.

If we can be of further service to you, please let us know.

Sincerely,

PAUL C. ACKERMAN.

(The survey referred to follows:)

HYDRAULIC BRAKE FLUID SURVEY, DECEMBER 30, 1960

A total of 76 commercial brake fluids were purchased in the Detroit area during the spring and summer of 1960 to determine the type and quality of hydraulic brake fluids marketed at that time. It is believed that the information obtained will be of interest to the members of the SAE hydraulic brake fluids subcommittee. The following table shows the type designation of the brake fluids purchased, and a comparison with commercial brake fluids purchased during a similar survey in 1955.

	1960 brake fluid survey	1955 brake fluid survey
Number of commercial brake fluids purchased.....	76	60
Fluids without SAE designation on the label.....	15	23
Fluids labeled SAE 70R2.....	6	12
Fluids labeled SAE 70R1.....	35	25
Fluids labeled SAE 70R3.....	20

All hydraulic brake fluids were purchased from service stations, automobile dealers, automobile accessories stores, or similar outlets. Over 200 retail outlets were included in the survey. Many sold several or more brands of brake fluids with some duplication of individual brands in the outlets contacted. The following table illustrates the distribution of the different types of commercial brake fluids purchased.

Retail outlet	Nonstandard	SAE 70R2	SAE 70R1	SAE 70R3
Service stations.....	21	3	58	26
Auto accessories stores.....	68	41	104	44
Auto dealers.....			3	5
Total.....	89	44	165	75

The quality of these brake fluids is illustrated by the following data on boiling points.

Type brake fluid	Number of fluids tested		Average SAE boiling point		Comment
	1955	1960	1955	1960	
Nonstandard.....	23	15	181.0° F...	179.0° F...	All unsuitable. Do. 8 unsuitable.
Moderate duty SAE 70R2 (Obs.).....	12	6	245.5° F...	258.0° F...	
Heavy duty SAE 70R1.....	25	35	333.3° F...	319.8° F...	
Heavy duty SAE 70R3.....		20		399.1° F...	

All commercial brake fluids, designated as conforming to SAE 70R1 or SAE 70R3 specifications, were tested for all SAE 70R specification requirements except lubrication (3.5 or 7.5) and residue and corrosion (3.6 or 7.6).

The attached table No. 1 shows the commercial brake fluids which did not conform to SAE 70R1 specification requirements. Table No. 2 similarly shows the SAE 70R3 type brake fluids.

The following is a summary of the SAE 70R type brake fluids tested.

	SAE 70R1 Heavy duty	SAE 70R3 heavy duty
Number of commercial fluids tested.....	35	20
Number of samples not conforming.....	15	2
Percentage samples not conforming.....	42.86	10

It should be noted that out of a total of 80 individual tests which did not conform to SAE 70R1 specification requirements, 8 brake fluids accounted for 90 percent of these failures to conform to SAE 70R1. All eight of these brake fluids would be unsuitable for use in hydraulic brake systems.

TABLE 1.—SAE 70R1 type

SAE specifications	SAE 70R1 requirements	Code number of trade name, brake fluids not conforming
Viscosity (kinematic) at -40° F. (maximum).....	1,800 cs.....	27-48-59.
Cold test A, 6 days at -40° F.:		
Time of flow.....	5 seconds (maximum).....	39-42.
Stratification, maximum.....	None.....	24-43-70.
Precipitation, maximum.....	do.....	23-24-39-42.
Cold test B, 6 hours at -60° F.: Time of flow, maximum.....	5 seconds.....	
Boiling point, minimum.....	300° F.....	24-62.
Boiling point change, minimum boiling point after heating.....	295° F.....	24.
Water tolerance at 140° F.:		
Stratification, maximum.....	None.....	24-39.
Precipitation, maximum.....	Light.....	
Water tolerance at -40° F.:		
Stratification, maximum.....	None.....	43.
Precipitation, maximum.....	Light.....	24-39.
Time to flow, maximum.....	5 seconds.....	
Corrosion loss in milligrams per square centimeter:		
Tinned iron.....	0.2.....	16-27-42-65-70.
Steel.....	0.2.....	27-42-65-70.
Aluminum.....	0.1.....	
Cast iron.....	0.2.....	27-42-65-70.
Brass.....	0.5.....	70.
Copper.....	0.5.....	23-27-42-65-70.
Pitting, maximum.....	Slight.....	
Condition of fluid gel, maximum.....	None.....	23-24-27-39-42-65-70.
Precipitation, maximum.....	Medium.....	43-65-70.
Natural rubber swelling, 120 hours at 158° F.....	0.050 inch to 0.005 inch.....	
Compatibility at 140° F.:		
Stratification, maximum.....	None.....	23-24-39.
Precipitation, maximum.....	do.....	16-23-34-39.
Compatibility at -40° F.:		
Stratification, maximum.....	do.....	23-24-39-43.
Precipitation, maximum.....	do.....	23-24-39-43-70.
Evaporation 48 hours at 210° F.:		
Loss, maximum.....	80.0 percent.....	6-20-27-65-70.
Quality of residue:		
Precipitate.....	Small.....	
	Nonabrasive.....	23-24-39-42-65-70-76.
Fluid at 32° F.....	Liquid.....	42-65-70.

TABLE 2.—SAE 70R3 type

SAE specifications	SAE 70R3 requirements	Code number of trade name, brake fluids not conforming
Viscosity (kinematic) at -40° F, maximum.....	1800 cs.....	14.
Neutrality, pH.....	7 to 11.....	56.
Natural rubber swelling, 120 hours at 158° F.....	0.050 inch to 0.005 inch.....	56.
GR-S rubber swelling, 70 hours at 250° F.....	0.055 inch to 0.005 inch.....	56.

Mr. ROBERTS. I have a copy of a letter from Mr. L. S. Harris, executive director of the American Association of Motor Vehicle Administrators, in which he provides some very interesting and valuable information regarding State laws and regulations relating to hydraulic brake fluid.

Without objection, I would like to include his letter, and since it is rather a lengthy one, I will defer from the reading of it at this time.

(The letter referred to follows:)

AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS, INC.,
Washington, D.C., March 21, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and
Foreign Commerce, House of Representatives, Washington, D.C.

DEAR CONGRESSMAN ROBERTS: As requested in your letter of March 10, we are
pleased to give you the following information with reference to laws and regu-
lations in the several States relating to hydraulic brake fluid.

The sale of brake fluid not meeting minimum standards is prohibited in 26
States, as follows:

Alabama	Minnesota
Arizona	Mississippi
Arkansas	New Jersey (regulation)
California	New York
Connecticut	North Carolina
Delaware	Oklahoma
Florida	Pennsylvania
Georgia	Rhode Island
Kentucky	South Carolina
Louisiana	Tennessee
Maine	Texas
Massachusetts	Virginia
Michigan	Wisconsin

and in the District of Columbia.

Also it is illegal to use such standard fluid in Alaska, Kentucky, Delaware,
Massachusetts, North Carolina, Oklahoma, or Rhode Island, or to add such fluid
to a braking system in Connecticut, Delaware, Georgia, Massachusetts, Pennsylv-
vania, or Virginia.

In the legislative sessions of 1961, bills have been introduced in at least five
additional States to regulate the sale and use of hydraulic brake fluids for
motor vehicles. These States are: Colorado, Kansas, New Hampshire, Ohio, and
Utah.

The existing State laws are based closely on section 12-305 of the Uniform
Vehicle Code, the nationally recommended guide for State legislation in the
field of motor vehicles and highway traffic. The Uniform Code was revised in
1956 to include this section, which reads as follows:

"Section 12-305—Hydraulic brake fluid

"(a) The term 'hydraulic brake fluid' as used in this section shall mean the
liquid medium through which force is transmitted to the brakes in the hydraulic
brake system of a vehicle.

"(b) Hydraulic brake fluid shall be distributed and serviced with due regard
for the safety of the occupants of the vehicle and the public.

"(c) The (department or official) shall, after public hearing following due
notice, adopt and enforce regulations for the administration of this section and
shall adopt and publish standards and specifications for hydraulic brake fluid
which shall correlate with, and so far as practicable conform to, the then current
standards and specifications of the Society of Automotive Engineers applicable
to such fluid.

"(d) No person shall distribute, have for sale, offer for sale, sell or service
any vehicle with any hydraulic brake fluid unless it complies with the require-
ments of this section."

The Uniform Vehicle Code also recommends, in a footnote to the above sec-
tion, "that administrative regulations (1) prohibit the sale of any brake fluid
which does not meet the specifications established by the Society of Automotive
Engineers for heavy-duty-type brake fluid," and "require that the label on the
container show compliance with the SAE heavy-duty-type brake-fluid specifica-
tions."

SAE specifications for brake fluid 70R1 (or a later designation of an improved
product) are set by law in Mississippi and Wisconsin as the required standard,
and the laws of Kentucky, Oklahoma, and South Carolina specify SAE 70R1 as
the minimum standard. Arizona, Alaska, and Michigan specify SAE heavy-duty-
type brake fluid.

The other States provide for the adoption of specifications by State officials. In Georgia, standards may be no lower than SAE 70R1; standards no lower than SAE specifications for heavy-duty brake fluid are required in Arizona, Arkansas, California, Delaware, Florida, Louisiana, New Jersey, Pennsylvania, and Tennessee; and standards conforming to current SAE specifications are specified in Maine and Virginia.

Minnesota, North Carolina, and Texas laws do not specifically limit the discretion of the official concerned.

Permits for the labeling of brake fluid are required by law in Alabama, California, Georgia, Louisiana, and Oklahoma, and labeling of containers is regulated in Alaska, Arizona, California, Georgia, Kentucky, Louisiana, Mississippi, New York, Oklahoma, Pennsylvania, South Carolina, Texas, Virginia, and Wisconsin.

As a sample of State regulations, we are enclosing a copy of "Rules and Regulations Relating to Minimum Standards for Brake Fluid," promulgated by the Arizona State Highway Department, which includes verbatim the SAE heavy-duty brake fluid standards (70R1).

If your committee should decide that Federal legislation is desirable, to replace or supplement the rapidly-expanding State action in this field, it is suggested that the bill, H.R. 2446, as introduced, might be strengthened by a requirement that the label on the container show compliance with the specifications prescribed by the Secretary of Commerce. And it appears that such legislation, if enacted, might be more effective if some department or agency, say, the Department of Commerce, were given definite responsibility for enforcement of its provisions.

Since this association has taken no formal position on the question of whether Federal legislation relating to brake fluid is necessary or desirable, we offer no recommendation on that point.

But my personal view is that it would be unwise at this time for the Federal Government to enter directly and actively into the big, complex field of motor vehicle regulation. I would like to see more time given to the States to deal effectively with this relatively minor and relatively new problem.

Respectfully yours,

L. S. HARRIS, *Executive Director.*

Mr. ROBERTS. At this time, with the understanding that the record will remain open for the inclusion of other reports, the committee will be adjourned.

(Whereupon, at 10:50 a.m., the hearing was adjourned.)

MOTOR VEHICLE SAFETY STANDARDS

MONDAY, MARCH 27, 1961

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY OF THE
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts (chairman of the subcommittee) presiding.

Present: Representative Roberts, Rogers of Florida, Schenck, and Thomson.

Mr. ROBERTS. The subcommittee will please be in order.

The Subcommittee on Health and Safety is meeting this morning to begin hearings on H.R. 903, by our colleague, Congressman Charles E. Bennett of Florida, and H.R. 1341, which I introduced. Both deal with motor vehicle safety.

Mr. Bennett's bill would require certain safety devices on motor vehicles sold, shipped, or used in interstate commerce. My bill would have the Secretary of Commerce establish minimum safety standards for passenger-carrying motor vehicles purchased by the Federal Government.

Hearings were held on these two proposals in July 1959, when an extensive record was built up regarding the urgent need for safer motor vehicles to cut down the appalling toll of deaths and injuries in highway accidents.

I see no need for repeating in detail the very complete record made at that time but we do want to bring the record up to date and refresh some memories regarding the need to protect the people who use our streets and highways from certain very definite hazards that have been identified from time to time by doctors, engineers, safety experts, and others who have been working in this field.

Without objection the two bills, and the agency reports will be included in the record at this point.

(H.R. 903 and H.R. 1341 follow):

[H.R. 903, 87th Cong., 1st sess.]

A BILL To require certain safety devices on motor vehicles sold, shipped, or used in interstate commerce, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) the Secretary of Commerce shall prescribe and publish in the Federal Register standards for devices for use on motor vehicles, designed to provide the public with the safest possible automobiles without unreasonably increasing automobile costs, such devices to include but not be limited to the following:

(1) (A) A governor which limits the top speed of the vehicle to eighty miles per hour, or to such top speed in excess of eighty miles per hour as the Secretary

deems appropriate, or (B) an engine of a horsepower rating which limits the top speed of the vehicle to eighty miles per hour, or to such top speed in excess of eighty miles per hour as the Secretary deems appropriate.

- (2) Safety padding for the passenger compartment of the vehicle.
- (3) Steering and other vehicle controls.
- (4) Bumpers, fenders, and other shock-absorbing equipment.
- (5) Headlights and other lights.
- (6) Brakes.
- (7) Aids to visibility including rear vision mirrors.
- (8) Tires.

(b) Standards first established under subsection (a) of this section shall be so prescribed and published not later than one year after the date of enactment of this Act.

SEC. 2. (a) The manufacture for sale, the sale, or the offering for sale, in interstate commerce, or the importation into the United States, or the introduction, delivery for introduction, transportation or causing to be transported in, interstate commerce or for the purpose of sale, or delivery after sale in interstate commerce, or the use in interstate commerce, of any motor vehicle manufactured on or after the date this section takes effect, shall be unlawful unless such motor vehicle is equipped with the devices enumerated in the first section of this Act which conform to the standards prescribed for such devices pursuant to such first section.

(b) The manufacture for sale, the sale, or the offering for sale, in interstate commerce, or the importation into the United States, or in the introduction, delivery for introduction, transportation or causing to be transported in, interstate commerce or for the purpose of sale, or delivery after sale in interstate commerce, or the use in interstate commerce of any of the devices enumerated in the first section of this Act as a replacement part on a motor vehicle manufactured on or after the date this section takes effect, shall be unlawful unless such device conforms to the standards prescribed pursuant to the first section of this Act.

(c) Whoever violates this section shall be fined not more than \$1,000, or imprisoned not more than one year, or both.

SEC. 3. As used in this Act—

(1) The term "interstate commerce" includes commerce between one State, Territory, possession, the District of Columbia, or the Commonwealth of Puerto Rico and another State, Territory, possession, the District of Columbia, or the Commonwealth of Puerto Rico.

(2) The term "motor vehicle" means any vehicle or machine propelled or drawn by mechanical power and used on the highways principally in the transportation of passengers.

SEC. 4. This Act shall not apply—

(1) to any motor vehicle manufactured in the United States for export and sold in a foreign country; and

(2) to any motor vehicle manufactured for, and sold to, a law enforcement agency, fire department, or an organization providing ambulance service, for use by such agency, department, or organization in the performance of its functions, except that such agency, department, or organization shall not sell or otherwise dispose of such motor vehicle to any other person unless such motor vehicle complies with all of the provisions of this Act.

SEC. 5. This Act shall take effect on the date of its enactment except that section 2 shall take effect on such date as the Secretary of Commerce shall determine but such date shall be not less than one year nor more than three years after the date of publication of standards first established under the first section of this Act. If such standards first established are thereafter changed, such standards as so changed shall take effect on such date as the Secretary of Commerce shall determine but such date shall be not less than one year nor more than three years after the date of their publication in accordance with the provisions of the first section of this Act.

[H.R. 1341, 87th Cong., 1st sess.]

A BILL To require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That no motor vehicle manufactured on or after the effective date of this section shall be acquired by purchase by the

Federal Government for use by the Federal Government unless such motor vehicle is equipped with such reasonable safety devices as the Secretary of Commerce shall require which conform with standards prescribed by him in accordance with section 2.

SEC. 2. The Secretary of Commerce shall prescribe and publish in the Federal Register commercial standards for such safety devices as he may require under authority of the first section of this Act. The standards first established under this section shall be prescribed and published not later than one year from the date of enactment of this Act.

SEC. 3. As used in this Act—

(1) The term "motor vehicle" means any vehicle, self-propelled or drawn by mechanical power, designed for use on the highways principally for the transportation of passengers except any vehicle designed or used for military field training, combat, or tactical purposes.

(2) The term "Federal Government" includes the legislative, executive, and judicial branches of the Government of the United States, and the government of the District of Columbia.

SEC. 4. This Act shall take effect on the date of its enactment except that the first section of this Act shall take effect one year and ninety days after the date of publication of commercial standards first established under section 2 of this Act. If such standards as so first established are thereafter changed, such standards, as so changed, shall take effect one year and ninety days after the date of publication of such changed standards.

(The agency reports follow:)

THE SECRETARY OF COMMERCE,
Washington, D.C., March 28, 1961.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in reply to your request of February 9, 1961, for the views of this Department with respect to H.R. 903, a bill to require certain safety devices on motor vehicles sold, shipped, or used in interstate commerce, and for other purposes.

The bill would require the Secretary of Commerce to prescribe standards for specified safety devices for use on motor vehicles. Included are speed governors, safety padding, steering controls, bumpers, headlamps and other lighting equipment, brakes, mirrors, and tires, but the bill is not limited to these items.

Among the qualified authorities in the motor vehicle safety field, we find divergent views on the acceptability of the several items designated in the bill for standardization. We agree that those susceptible of being standardized should be a vital part of the national concern, and that Federal cooperation should be extended wherever feasible to improve the safety of motor vehicles and motor vehicle safety equipment.

The provisions of this bill involve the policy question raised in my March 24 comments to you on H.R. 2446, that is, the respective roles of Federal and State Government in the regulation of the motor vehicle safety field. On this broad issue we think that it would be helpful to have the views of the Inter-governmental Relations Commission, as we suggested in our comments on H.R. 2446. For this reason, we should like to defer presenting, for the time being, specific conclusions on the technical merits of the safety regulation features contained in H.R. 903.

The Bureau of the Budget advised there would be no objection to the submission of this report from the standpoint of the administration's program.

Sincerely yours,

LUTHER H. HODGES,
Secretary of Commerce.

GENERAL SERVICES ADMINISTRATION,
Washington, D.C., April 14, 1961.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: In response to your request of February 9, 1961, on March 28 General Services Administration submitted to your committee a report on H.R. 1341, a bill to require passenger-carrying motor vehicles purchased for

use by the Federal Government to meet certain safety standards. We now wish to take the liberty of submitting the following revised report on the subject legislation.

The General Services Administration is in full accord with the objectives expressed in H.R. 1341. As you know, the Federal Property and Administrative Services Act of 1949, as amended, gives the General Services Administration necessary technical authority to prescribe procurement standards for motor vehicles for use by the executive agencies and it is believed that the General Services Administration has fully exercised such authority. However, there may be a beneficial effect from the enactment of legislation which would clearly define the responsibility of establishing requirements for safety devices to be installed on motor vehicles sold to the Federal Government.

In keeping with good business practices, the General Services Administration believes that the responsibility for prescribing safety standards should rest with the agency responsible for the other vehicle procurement standards. Accordingly, if the words "Secretary of Commerce" in lines 7 and 10 on page 1 of the bill were stricken and the words "Administrator of General Services" were inserted in lieu thereof, the General Services Administration would interpose no objection to its enactment.

In determining safety devices which should be added to the procurement standards, the General Services Administration will seek the recommendations of the Interdepartmental Highway Safety Board, established by Executive Order 10898, dated December 2, 1960, and which, it is understood, is now becoming operative. It is our viewpoint that this Board can render an invaluable service in correlating research on traffic safety and in encouraging the manufacturers to incorporate safety items into their motor vehicle design.

We are unable to offer an estimate of the possible cost attributable to H.R. 1341; however, as additional safety devices are required, the purchase cost of motor vehicles will increase. In this connection it should be recognized that under the present statutory price limitation for passenger cars there is very little latitude for additional safety devices. However, as safety accessories are proven by research and testing, the General Services Administration will request such changes in price limitations as are indicated to be necessary to cover the cost of the new devices.

The Bureau of the Budget has advised that, from the standpoint of the administration's program, there is no objection to the submission of this report to your committee.

Sincerely yours,

JOHN L. MOORE, *Administrator.*

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., April 17, 1961.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.*

MY DEAR MR. CHAIRMAN: This is in response to your letter of February 9, 1961, requesting a report on H.R. 1341, a bill to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

This bill would require the Secretary of Commerce to prescribe safety standards for vehicles purchased by the Federal Government.

We are in accord with the objectives of H.R. 1341 but are of the opinion that the establishment of standards covering motor vehicle safety devices and specifications incident thereto should remain under the authority of the Administrator of General Services. Staff of the General Services Administration work on a continuing basis with the manufacturers of motor vehicles on technical and performance specifications and it is not believed desirable or feasible to separate standards and specifications on motor vehicle safety devices from the general standards and specification responsibility of the GSA. In view of this, we suggest that H.R. 1341 be amended to substitute the Administrator of General Services for the Secretary of Commerce in sections 1 and 2 of the bill. If the bill is so amended, we recommend enactment.

In furthering the objective of this legislation, it is our understanding that the General Services Administration intends to solicit advice and recommendations from the Interdepartmental Highway Safety Board which was established by Executive Order 10898, dated December 2, 1960, and which, among other responsibilities, is required to provide leadership to, and coordinate the traffic safety aspects of programs carried on by the departments and agencies of the Federal Government. Advice from this Board, which is chaired by the Secretary of Commerce, should be of material assistance to the GSA in promulgating standards covering safety devices and in the preparation of suitable specifications in connection therewith.

The General Services Administration and the Department of Health, Education, and Welfare are reporting on H.R. 1341 and the viewpoints expressed in the reports are concurred in generally by the Bureau of the Budget.

Sincerely yours,

PHILLIP S. HUGHES,
Assistant Director for Legislative Reference.

THE SECRETARY OF COMMERCE,
Washington, D.C., June 16, 1961.

HON. OREN HARRIS,
*Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in further reference to H.R. 1341 upon which you requested the views of this Department by letter of February 9, 1961. Our comments were submitted to you March 28, 1961, regarding H.R. 1341, a bill to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

We have reconsidered this matter and would appreciate having this report substituted for our report of March 28.

H.R. 1341 would (1) require the Secretary of Commerce to designate safety devices for vehicles and (2) require the Secretary to prescribe standards for such devices and publish in the Federal Register commercial standards for such safety devices for vehicles purchased by the Federal Government.

The General Services Administration, with a few exceptions, presently purchases all passenger-carrying vehicles for the use of the Government. That agency already includes various safety requirements in its procurement specifications. Consequently the procurement agency, which is the General Services Administration, should fix the standards for safety devices.

This Department does have an interest in this subject; however, we feel that it should be the responsibility of General Services Administration to prescribe minimum safety standards for vehicles purchased by the Federal Government.

Therefore, it is recommended that H.R. 1341 be amended as follows:

Page 1, line 7: "Secretary of Commerce" change to read: "the Administrator of the General Services Administration."

Page 1, line 10: "the Secretary of Commerce" change to read: "the Administrator of the General Services Administration."

In this connection, we would also like to call to your attention the highway safety report sent to Congress in accordance with section 117 of the Federal-Aid Highway Act of 1956 (H. Doc. 93, 86th Cong., 1st sess.), which concluded that the advancement of safety in vehicle design and equipment was a responsibility, not of any one level of the Government, but of industry as well. Furthermore, it has been found that as to some aspects of vehicle design relating to highway safety, there is at present no accepted or practical basis for standardization. The Interdepartmental Highway Safety Board, recently established by Executive order, could promote intensified work on safety standards for devices on passenger vehicles acquired by the Government.

The Department on Commerce would not be opposed to the enactment of H.R. 1341 if amended as suggested above.

The Bureau of the Budget advises that there is no objection to the submission of this report from the standpoint of the administration.

Sincerely yours,

EDWARD GUDEMAN,
Under Secretary of Commerce.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
Washington, D.C., April 17, 1961.

HON. OREN HARRIS,
Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: This letter is in response to your request of March 13, 1961, for a report on H.R. 1341, a bill to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

This bill would forbid purchase of passenger-carrying motor vehicles (except certain military vehicles) for use by the Federal Government unless they are equipped with such reasonable safety devices as the Secretary of Commerce shall require, and such devices are in conformance with commercial standards prescribed by him. The standards first established would have to be prescribed and published not later than 1 year after enactment of the bill, but the prohibition against purchase of automobiles not meeting the Secretary's requirements would apply only to vehicles manufactured on or after the expiration of 1 year and 90 days after publication of the Secretary's initial standards. The effective date of any changes in such standards would be deferred for a like period after publication.

While the bill does not so provide, the House Committee on Interstate and Foreign Commerce (86th Cong.) in reporting favorably on a similar bill introduced last year stated:

"Before any standards are prescribed, the Secretary should give adequate notice and provide all interested persons opportunity to present views and suggestions. It is expected that the Secretary will consult with, and consider suggestions, from the automobile manufacturing industry, the U.S. Public Health Service, other Government agencies, experts in the field of medicine and surgery, engineers, experts in the field of safety, and any others who might be of assistance.

"There is no reason why the requirements made by the Secretary should work any hardship on industry or the Government." (H.R. Rept. No. 715 (86th Cong.), p. 6).

This Department—which, through the Public Health Service, is conducting studies in the field of automobile accident causation and prevention—has a vital interest in any method which will help reduce the number of automobile accidents and resultant injuries and deaths. In 1959 there were approximately 37,910 fatalities from automobile accidents reported to the Public Health Service's National Office of Vital Statistics. The National Health Survey, published by the Service, estimated that there were 4,172,000 injuries resulting from motor vehicle accidents during that year. This loss of life and injury to persons has made highway accidents one of our leading health and safety problems.

Experts generally agree that the "human factor," rather than mechanical inadequacies of motor vehicles, is the cause of most accidents. Nevertheless, improvements in design and equipment of cars can to some extent compensate for this factor, not only from the point of view of accident prevention but, even more, from the standpoint of reducing the severity of injuries when accidents do occur.

Considerable knowledge already exists which, if utilized by motor vehicle manufacturers, would tend to reduce at least the severity of injuries suffered in such accidents. For example, we believe that seat belts, or at least anchorage for seat belts, should be standard equipment for passenger cars and buses; that seats should be anchored as to lock them into position; that there should be crash padding of the dashboard, roof, and other areas of the vehicle against which passengers might be thrown; that there should be improvements in the steering wheel in addition to recessing of the post; and that the interior of the car should, so far as possible, be cleared of dangerous knobs, sharp edges, etc.

Such improvements have been strongly supported by safety engineers, research experts, and physicians. Information in the study completed by the Department of Commerce pursuant to section 117 of the Federal-Aid Highway Act of 1956 showed that users of seat belts had a 60 percent less chance of injury than nonusers who remained in the car in a crash and 80 percent less chance of injury than nonusers who were thrown from the car. To be sure, a practical limitation to the effectiveness of seat belts as a safety device is the frequent failure of individuals to use them, even if available. However, it seems clear that the adoption of seat belts and other reasonable safety standards by the Federal Government could play an important role in stimulating public demand for safety devices on all vehicles, as well as substantially reducing the severity of injuries resulting from accidents involving federally owned vehicles.

In this connection, it should be noted that Federal Supply Standard 122, promulgated by the General Services Administration, provides an option under which agencies may order seat belts for motorcars. Recently, the automobile manufacturers indicated that anchorage for seat belts on the front seat will be a standard feature in the 1962 car models; this important first step will facilitate the installation of such seat belts in any passenger automobile, whether or not purchased by the Federal Government.

If, however, in line with the desirable objective of this bill, the Federal Government is to provide effective leadership in promoting the use of safety devices by its example, then any action toward this end must begin with adequate provision for financing the acquisition of the additional equipment indicated. The present \$1,500 statutory cost limitation for passenger cars (\$1,950 for station wagons), currently specified in Public Law 86-642, section 201, has been held to include the original cost of the vehicle as well as all equipment or accessories which are permanently attached to and become a part of the vehicle and which contribute to the comfort and convenience of its passengers and its efficient operation as a passenger-carrying vehicle (19 Comp. Gen. 988, 990; 36 Comp. Gen. 726). Thus, it is apparent that the current cost limitation makes it virtually impossible for the Federal Government to install any additional equipment that might serve useful safety purposes or to purchase models incorporating certain safety features in their design, notwithstanding the basic authority of the GSA to amend its procurement standards so as to require or permit such safety equipment or features. We therefore urge that existing laws be revised, either by exempting, or conferring authority to exempt, such safety devices or features from the ceiling on the purchase price of Government cars or by appropriate adjustment or removal of the ceiling. Of course, in the interest of economy, the Government should at the same time urge manufacturers to include such devices or fixtures in cars as standard equipment so far as possible.

Whether in connection with action on the dollar ceiling or otherwise, it would seem appropriate for Congress to make clear that Federal leadership, through the incorporation, in standard specifications for Government cars, of special requirements for safety features that are nonstandard in passenger automobiles produced for the general market is considered compatible with the overall objective of economy in Federal procurement operations.

We, therefore, wholeheartedly endorse the principle of this bill.

As respects the details of the bill, some technical revision of the present bill seems desirable.

1. The bill would provide that "no motor vehicle manufactured on or after the effective date of this section shall be acquired by purchase by the Federal Government * * * unless such motor vehicle is equipped with such reasonable safety devices as the Secretary of Commerce shall require * * *." The clear implication of this language is that prescribed safety devices should be mandatory equipment on vehicles at the time of the purchase of the vehicles by the Federal Government. While this is desirable in general, an inflexible requirement of this kind would, for instance, prevent the immediate utilization of safety devices where available in the form of accessories of subassemblies until such time as structural changes necessary for best placement of a safety device on a new vehicle can be made by the manufacturer. Further, we question whether 2 years and 90 days, the maximum time allotted by the bill for the automobile industry to meet the initial standards promulgated under the bill, would prove adequate in certain instances. An approach emphasizing flexibility as to both how and when safety devices may be installed would seem likely to yield the best results.

2. The bill, as drawn, is limited in its application to motor vehicles designed principally for the transportation of passengers. Inasmuch as the considerations underlying the proposal of this bill would seem, in large measure, to apply to pickup trucks and the number of such trucks purchased by the Federal Government is large, the committee may wish to consider enlarging the scope of the bill to include such vehicles.

3. We understand that the Commerce Department, the General Services Administration, and the Budget Bureau are agreed that, if legislation along the lines of H.R. 1341 is favorably considered, statutory responsibility for the promulgation of safety standards should be lodged in the Administrator of General Services, since the GSA is the agency now charged by law with basic authority for setting general standards for Federal procurement of motor vehicles, and since the establishment of standards under the bill should, logically, be integrally

related to the exercise of such basic authority. This change in the bill would be agreeable to this Department. We, of course, stand ready, to cooperate in the further development and utilization of interagency mechanisms for advising and assisting the standard-setting agency in the establishment of appropriate safety standards under the bill.

We are advised by the Bureau of the Budget that there is no objection to the presentation of this report from the standpoint of the administration's program.

Sincerely yours,

ABRAHAM RIBICOFF, *Secretary.*

Mr. ROBERTS. At this time I desire to read into the record and to insert therein, certain statements, by witnesses who have heretofore testified in connection with the bills.

In our 1959 hearings, we heard a very interesting and constructive statement by General Stewart, executive vice president of the National Safety Council. He is unable to be present today, but I have a statement from him which I ask to be included in the record at this point. And since it is very short, I will read it at this time:

Over the years the automobile industry has equipped motor vehicles with many devices which make it easier for a motor vehicle operator to drive safely, or which substantially reduce the potential for injury to vehicle occupants in the event of an accident.

Many of the improvements that make it easier for an operator to drive safely have been welcomed by purchasers and are now standard equipment on many of today's models.

Certain devices which give protection to occupants of a vehicle in the event of an accident have not been widely accepted by the public and their installation is generally on an optional basis, with added costs.

The National Safety Council is convinced from the results of tests and from specific experiences that the installation and use of devices designed to reduce the injury potential to occupants in the event of an accident would, if installed and used, reduce traffic injuries to occupants by one-half. The council therefore is doing all it can to educate the public to the added protection such devices provide. The problem is to inform and convince people that the added expense and perhaps minor inconveniences associated with these devices are well worth while.

It is in this context that the council believes that the purposes of H.R. 1341 are worthy of favorable consideration by your committee.

The requirement that federally owned or operated motor vehicles be equipped with all reasonable safety devices will not solve today's traffic accident problem. It would, however, be a contribution to traffic safety.

The National Safety Council takes no position with respect to any differences of opinion that may exist concerning the technical language of the bill. We do believe, however, that the full potential of the bill will be realized only if it has the enthusiastic support of all concerned.

Mr. SCHENCK. Mr. Chairman, I think that we could sum up the purpose of these bills as an effort to obtain a safer cabin or inclosure in which the passenger rides, both by design and in original equipment. That is, in general the idea and general purpose plus urging the motorists to use the various safety devices which are not now accepted as general equipment, but those which have been proven to be very helpful in the way of promoting safety.

We have found in our committee hearings, I think, that if people can be kept within the car in an accident that the possibility of serious injury is substantially reduced.

I think that we can say as the result of work of this committee in past years much has been done in the way of improving door locks and in putting greater emphasis on various safety features.

Mr. ROBERTS. I would say to the gentleman from Ohio that the subcommittee has tried to do that, and what it has tried to do is a

very simple proposition: It has never been the intent of the subcommittee to enter into the design or the manufacture of an automobile. That is the reason we have left it in the hands of the Department of Commerce and the Bureau of Standards to say what is a reasonably safe device. We simply ask in this bill, which passed the House last year by a very good margin, that the Federal Government take some steps in seeing to it that these devices are placed on the cars that it purchases, to set an example, such as we do in the field of aviation and in surface transportation, in the maritime field and in the food and drug field. We simply take the position that the Federal Government would, by insisting that these devices be placed on its cars it purchases, be in the position of setting an example of leadership for the general public.

We believe that once we have an adequate body of statistics, which we would have through Government departmental records, that we could prove that these devices are capable of saving lives. We would then, I think, see that the use of these devices would be widespread. There would be a certain demand from the public that these devices be placed on the automobiles as standard equipment, and not as optional equipment.

I would like to say that I think the activities of this committee spelled out, first of all, the agreement on the part of the manufacturers, in the adoption of the resolution by the American Automobile Manufacturers Association, which, I believe, dates back to 1956, the first year of the life of this subcommittee.

I think, too, the committee has had a very good effect on the States in adopting similar resolutions which gave impetus to the States to go ahead and reach national compacts with reference to uniformity and in trying to eliminate the very confusing picture that the motorist encounters in driving from one coast to the other and from the Gulf of Mexico to the Great Lakes.

The committee, I believe, was of some influence in the recent news that the manufacturers have agreed that in their next year's models all of the cars will have a provision made for seat belt attachments, clamps or fasteners, so that the installation of safety belts will not be a major operation. That is a fine and forward step. I think that if we could get widespread use of safety belts, as we have in airplanes, many lives would be saved on our streets, roads, and highways.

Mr. SCHENCK. If you will yield further, Mr. Chairman, I would like to agree with everything you have said and to point out that we have never tried to control the design of the automobiles. Our efforts in these matters have been directed to encourage the manufacturers to give greater attention to designing cars that would be safer for the occupants.

I think in connection with that all automobile manufacturers and related professional organizations have made real contributions by agreeing to give cross licensing and full information on all matters that they have developed in their crash test programs.

I think we have had some very wonderful cooperation from our automobile manufacturers and the engineers. They have been very helpful.

Mr. ROBERTS. The Chair would, certainly, not want to fail to commend the gentleman from Ohio on the fine work that this effort

brought forth in the research bill that was adopted by the Congress last year providing for a thorough study of automobile exhaust fumes. That work is well underway by the Department of Health, Education, and Welfare.

And I think that one very fine result of his interest and devotion has been the discovery of a blowby device and other devices which we believe will one day very soon bring about the elimination of these noxious fumes from the atmosphere.

The National Conference on Air Pollution held a meeting in Washington about 2 years ago last fall. Scientists speaking at the conference did not specifically state that these fumes are harmful and carcinogenic, but they did state that people who were afflicted with some type of lung disorder and otherwise in weakened condition, to them these fumes could, perhaps, be the cause of a contributing factor in lung cancer.

I note with a great deal of interest that the State of California has already adopted legislation on this problem and new automobiles being sold in that State are being equipped with blowby devices to eliminate a great deal of these harmful gases.

At this time, I have before me a telegram which was received by me from Mr. Harry A. Sieben, safety director of the Minnesota Highway Department, bearing date of March 24, 1961, stating as follows:

Minnesota Legislature has adopted resolution memorializing the President and Congress of the United States to provide for safe standards for automobile vehicle design and safety devices, and for the enforcement of such standards in the automobile industry. Strongly urge your committee take action now and not be misled by organizations purporting to present State administrators.

I have a statement from Mr. William I. Stieglitz, chief of design, safety and reliability, Republic Aviation Corp., addressed to the Chair. And the letter follows:

DEAR MR. ROBERTS: In reply to your letter of March 13, I am enclosing herewith a statement relative to your bill, H.R. 1341, to establish safety standards for Government-owned passenger-carrying motor vehicles. As you know, I am strongly in favor of this legislation and sincerely trust that it will be enacted by the present Congress. If there is any way in which I can be of assistance, I am sure you know that you can call on me.

And without objection, his statement, which is attached to his letter, will be made a part of the record at this point.

(The statement follows:)

STATEMENT OF WILLIAM I. STEIGLITZ

During the hearings on bill H.R. 1341 held by the Subcommittee on Health and Safety of the 86th Congress in July 1959, I had the honor and privilege of testifying before the committee in favor of the proposed legislation. At that time I expressed the opinion that the provision of crash protection for occupants, and the elimination of many potential accident cause factors by the application of known human engineering data, were entirely feasible from an engineering standpoint, and supported this opinion by reference to experience of the aircraft industry. Insofar as this testimony appears in the records of the previous hearings, I shall not repeat it at this time.

In my previous testimony I further stated my opinion that legislation of this nature was definitely within the purview of the Congress, and referred to the Federal Aviation Act and the civil air regulations as analogous legislation in the public interest. Nothing that has occurred in the past 2 years has served to lessen the need for such legislation. The automobile industry has given little, if any, indication of a tendency toward self-policing which might indicate that the necessary goals would be achieved without legislative action. In fact, the only

announcement of any definite action on the part of the automobile manufacturers is the recent statement that 1962 models will contain provisions for the installation of seat belts as standard equipment and this announcement was made only after a conference between representatives of the automobile manufacturers and members of a New York State legislative committee with regard to proposed legislative action by New York State. It thus appears that the only real forward step with which I am familiar is being taken not voluntarily, but only under the threat of specific legislative action.

It is my opinion, as indicated in my previous testimony, that the wording of the bill should call for safety provisions in automotive vehicles rather than specifying the installation of safety devices. As I stated, there are often many ways of achieving a safety objective and real safety must be achieved by design rather than the incorporation of devices on a completed vehicle. Quite aside from the provision of crash injury protection, I believe that in the interests of accident prevention, standards are needed in regard to windshield reflections, glare, shape coding of control knobs to permit the driver to operate secondary controls without having to look down inside the automobile, and similar design features. A requirement for the incorporation of safety devices could not encompass such features.

Mr. ROBERTS. I also have a letter from Mr. James J. Ryan, professor at the University of Minnesota, Institute of Technology, dated March 22, 1961, with which he encloses his statement. And without objection I will put his statement into the record.

(The statement of James J. Ryan follows:)

STATEMENT OF JAMES RYAN, MARCH 27, 28, 1961

I, James J. Ryan, professor, Mechanical Engineering Department, Institute of Technology, University of Minnesota, Minneapolis, Minn., wish to supplement my statement presented before this honorable committee on July 8, 1959, with additional information relative to the subject of motor vehicle safety standards which is now being heard for consideration and passage in this legislative session.

During the past 12 years I have investigated and tested the design of automobiles for the prevention of injuries to the occupants upon crash. During the years, 1956-59, this work was sponsored by a contract from the U.S. Air Force through Col. John Paul Stapp and in the last 2 years, 1959-61, by a grant-in-aid from the U.S. Public Health Service through Dr. James L. Goddard.

Research into the safety of vehicle riders upon impact has been carried out through the reconstruction of automotive vehicles and the development of a cart of being driven into a wall at speeds from 15 to 40 miles per hour. One of the most important factors in crash deceleration is the means of absorbing the energy upon collision.

We have developed a hydraulic shock-absorbing bumper which uniformly slows the vehicle down through its displacement of 17 inches. Thus, the peak impacts which occur in present-day vehicles toward the end of the deceleration are removed and the maximum forces transmitted to the occupants of the vehicle are reduced by one half. The total number of tests involved in obtaining this result has now reached 65 and includes 4 cart impacts—1 with live occupants, 58 cart-impacts with dummies, and 4 cart-impacts with live subjects.

The forces transmitted to the vehicle have been shown to respond effectively to the hydraulic shock-absorbing bumper design. The bumper also keeps the engine and frontal parts going forward on impact and prevents penetration of the passenger compartment. This equipment could be installed on all new automotive vehicles without greatly increasing the cost or changing the appearance.

A second development of this research project has been the engineering application of seat belts. Although seat belts are suggested for every automotive rider, their positioning in cars has not been engineered but they have merely been installed. By proper engineering application the seat belts may be twice as effective. The improvements involve (1) the proper fastening to a rigid part of the vehicle such as a firmly anchored seat or a rigid portion of the floor or frame, (2) the proper anchoring of the seat to prevent its additional weight on the person supported by the seat belt after impact, (3) a means of tightening the belt upon impact by removing the slack through hydraulic pres-

sure exerted from the bumper, and (4) the use of automatic seat belts which retract against the back of the seat when not in use and which allow convenience and comfort through freedom of movement on a take-up reel—yet lock rigidly upon impact. Procedures by which the proper installation and operation of seat belts may be achieved have been developed by this laboratory.

A third consideration for automotive safety on impact is the rotation of the upper torso about the seat belt supported at the pelvic region. Two methods of absorbing this rotational energy are involved. They are a 10-inch diameter pad support on the steering wheel post for the driver to absorb the energy by bearing on the chest and by allowing the passenger to rotate with adequate clearance under the windshield to prevent striking the forward structure or dash of the compartment.

We have demonstrated, in March 1961, the safety riders on seat belts for both of these conditions—one impact at 20 miles per hour of a rider with a seat belt and adequate clearance, and another crash of a rider at 25 miles per hour on a seat belt with a protective steering wheel in position. Thus, we know from an engineering and medical standpoint the methods of preventing injury to the driver and passenger through the proper deceleration of the vehicle with a hydraulic shock-absorbing bumper and adequate restraint through the seat belt with proper steering wheel design and adequate forward clearance.

With this mechanical construction and from the human tests which we have performed without injury we believe that the forces occurring at 40-miles-per-hour impacts into solid objects or head-on would equally be within safe tolerance of a human. It has been established by statistics that the proper construction of the automotive vehicle will reduce the injuries, total disabilities, and deaths by one-half.

Our tests have shown the automotive manufacturers' claim that "cars are not built to crash" is invalid, and that it is as important to apply protective measures to automotive construction as it is to give polio shots to immunize from that disease. Above the 40-miles-per-hour impact injuries will be greatly reduced.

We feel that it is incumbent upon the Nation to demand that automotive structures be properly developed so that people will not be injured and killed upon crash. Certainly the first ocean liners did not have lifeboats, and aircraft were called crates until the CAA was established.

In engineering we know that proper automotive construction can be developed without increasing the cost or changing the appearance.

No excuse now exists for toleration of the infamous slaughter on the highways.

Mr. ROBERTS. I have a letter from L. S. Harris, executive director of the American Association of Motor Vehicle Administrators, and accompanying this letter is Mr. Harris' statement.

I will read his letter and place the statement, which is quite lengthy, into the record. His letter, dated March 24, 1961, is as follows:

In regard to H.R. 903 and H.R. 1341 for which hearings have been scheduled on March 27 and 28 by the Subcommittee on Health and Safety of the Committee on Interstate and Foreign Commerce, I beg to advise that I have studied these two bills and find that they are very similar to H.R. 722 and H.R. 1341 introduced in the 1959 session by Mr. Bennett and yourself, respectively. You will recall that I appeared before the subcommittee on July 8, 1959, and discussed the two 1959 bills with the committee at that time. Nothing has occurred since July 1959, to cause me to change or modify my opinions to justify any changes in my testimony insofar as the current bills are concerned.

I am enclosing herewith two copies of my 1959 statement filed with the committee and shown in the printed report of the committee hearings and respectfully request that the same statement be entered into the record of the hearings next week.

And without objection, his prepared statement will be made a part of the record at this time.

(Statement of Leland S. Harris follows:)

REMARKS OF LELAND S. HARRIS, EXECUTIVE DIRECTOR, AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS, WASHINGTON, D.C., JULY 8, 1959

Mr. Chairman and gentlemen of the subcommittee, I am Leland S. Harris. I am appearing as executive director of the American Association of Motor Vehicle Administrators for the purpose of informing the subcommittee as to the consensus of thinking of the members of the association pertaining to the five bills you are considering today.

The association was founded in 1933. Its headquarters are here in Washington. Its membership consists of the officials having responsibility for the administration and enforcement of motor vehicle laws and regulations of each State of the United States, the District of Columbia, the Provinces of Canada, Puerto Rico, U.S. Bureau of Public Roads and Bureau of Motor Carriers of the U.S. Interstate Commerce Commission.

The association is deeply concerned with equipment of motor vehicles in its relation to safety and all other problems arising from the operation of motor vehicles. Since its founding it has worked especially closely with the Automobile Manufacturers Association, the American Standards Association, and the Society of Automotive Engineers in developing standards for motor vehicles and motor vehicle equipment. This cooperation began in 1919, 14 years before the association was organized, by the then administrators of some of the Northeastern States in trying to improve headlights, and has continued unceasingly since then. We would all agree, I am sure, if we stopped to consider all of the work that has been done on vehicle lighting in the intervening 40 years that many advances have come from this joint effort, notably the sealed beam headlamp program.

The original sealed beam lamp resulted from a request from our association in 1937 to the manufacturers to undertake research for and developments of improved headlighting equipment which would be uniform and interchangeable, regardless of manufacturer. There have been several major improvements in headlamps since the original sealed beam lamp was introduced in 1940; one approved as recently as last month by this association, which is now being made available to the public as a replacement for lamps on vehicles using only two headlamps. These latest improvements have added approximately 160 feet to the sight distance of drivers when using the lower beam. We have also cooperated in the development of the four-headlamp system and I am confident we will see additional improvements in headlighting from the ever-continuing study being given the problem.

There are many items beside lights on which we have worked cooperatively with the automotive industry looking toward increased safety of operation. Among these are such items as brakes, glass, steering and steering wheels, rear vision mirrors and driver vision problems generally, mufflers, and tailpipes, directional and warning signals, reflectors, suspension systems, windshield wipers and washers, tires, body structures, door locks, padding and passenger packaging, seat belts and knobs and other projections.

In our work with the industry on improvement of items of equipment such as these, special engineering tests have been set up and conducted by the industry whenever this was necessary to bring out all pertinent facts to the satisfaction of our committee on engineering and vehicle inspection.

This committee has been working with automotive industry engineers since 1935 in this whole broad area of improved safety equipment. It meets in Detroit each June where it has always had available to it the industry's best engineers, scientists, and research personnel for information and discussions pertaining to automotive design and equipment problems, including proposed changes and improvements in design and equipment and new devices.

In the work of our members with the public on a year-round basis, we get constant reminders of the fact that no matter how many safety improvements are built into the vehicle, the motorist will not derive the maximum potential benefit from them unless there is proper and regular maintenance. Accordingly we have broadened the scope of our engineering program to provide better information and specific technical material for vehicle inspection officers. This will help them do a better job. We have had a series of joint sessions for both industry engineers and inspection officials and the most recent meeting was attended by representatives from 24 States.

We are continuing to follow closely the output of new statistical data on accidents as produced by the Cornell crash injury research program and had a review of the latest data at our committee meeting in June.

We are also being kept apprised of safety research developments such as those concerned with new concepts of vehicle control and methods of signaling and conveying basic information to drivers of motor vehicles.

It is our intention to evaluate the degree of promise in these various ideas, and to work cooperatively along channels that can lead to their incorporation into vehicles and the highway system.

We are convinced, on the basis of our experience over the years, that our joint work with the manufacturers and a sustained interest in safety of vehicles and equipment will continue to be productive of measurable improvements in highway safety.

All of the preceding information has been included in this statement to indicate to you gentlemen of the committee that nearly all of what is proposed in H.R. 722 and H.R. 1341 is already being done in a very comprehensive way. Federal intervention at this time would be a costly waste of effort and would probably result in serious injury to the economy of this Nation. I agree with the automobile manufacturers that the prescribing of standards and specifications by the Secretary of Commerce would create stagnation among automotive engineers and designers and eliminate competition to improve vehicles and equipment by the several manufacturers. It was this type of competition that brought about many of the improvements in motor vehicles we are enjoying today. Motor vehicle standards are, as we see them, standards of performance and are continually being raised. No one person or group of people, such as the staff of the Bureau of Standards, could possibly produce the continuity of improvements in performance standards for motor vehicles as has been the results of a very highly competitive industry.

In regard to H.R. 880 and H.R. 883, I am cognizant of two significant statements indirectly pertaining to the subjects of these bills which were made during the past year.

One is the report of our committee on engineering and vehicle inspection, which asserts that after a study and investigation of a great many kinds of specialized safety equipment, none has ever been discovered which, by itself, will eliminate traffic accidents.

The other authoritative statement is contained in the report, "The Federal Role in Highway Safety" submitted to the Congress in March 1959 by the Bureau of Public Roads following an intensive study made pursuant to a provision of the Federal-Aid Highway Act of 1956. It reads:

"Drivers and others commonly misunderstand accident causes and tend to overgeneralize, emphasizing one cause above all else. The driver, his vehicle, and the roadway are in practically every motor vehicle accident, but there are also a welter of environmental conditions, including weather, traffic, light, social, medical, and psychological variables, as well as pure chance. These constantly act and interact with the three principal factors and are equally there when the accident takes place. The single factor attack on safety calls for action against accident-prone drivers, alcohol, turnpike monotony, speed, horsepower, need for stiffer laws and police crackdowns, and other single corrective steps. The point is that many and sometimes all of these may be of consequence, and undue emphasis on any one to the neglect of others may impair the planning of an adequate highway safety program. Any one wholly effective solution to the traffic-accident problem would itself destroy highway transportation."

The record bespeaks the validity of the statement I have just quoted. If we look at the performances of the several States in the field of traffic safety, we find that those which have tackled the problem with a broad and balanced program, have consistently achieved the most tangible results in accident prevention.

In regard to H.R. 1346, we fully support the purpose of the bill, but believe it is at least 5 years premature.

The Governors' conference, a few years ago, created a special committee to study the highway safety problem with Governor Ribicoff of Connecticut as chairman. During the period of study, the committee visited Detroit to ascertain what the automotive industry was doing to improve the safety of motor vehicles and motor vehicle equipment. While in Detroit they learned, to the surprise of some committee members, of the longstanding program of cooperative work between the automotive industry and our association. The history of this program was outlined to them, along with the progress and improvements

made. In its report to the 1958 conference, the committee reviewed the progress and improvements which had resulted from the program and included a recommendation that the conference request our association to act as a coordinating agency for all the States in the matter of safety and design of motor vehicles and equipment. We accepted the assignment and our president will make the report to the Governors' conference next month covering the past year.

Although only one automobile model year has intervened since we accepted the assignment, and this was not a year in which major design changes were scheduled, it is possible to report several specific items of progress in vehicle equipment and safety. These include the completion of the most recent improvement in the sealed beam headlamp; a trend to wider stance cars and better stability on the highway; an improvement in rear vision through increases in rear glass areas; the stimulation by our committee on further research on rear vision problems by the industry; general improvement indicated in brake designs, brake linings and brake cooling; the completion of studies for improving the visibility and effectiveness of front turn signals and schoolbus warning signals; and, the general installation by the industry of longer life mufflers.

It is generally agreed that one of the weakest links in the entire traffic safety movement is our lack of knowledge as to the real causes of accidents. We know many of the factors that can be involved in accident situations, but when we get down to specific accidents, in all too many instances we simply lack information on which of the many possible contributing factors was really responsible for what took place.

Lacking information on the real causes of accidents, we have spent a great amount of time and effort concentrating on "circumstantial" causes. It seems to me we need much, much more research into the causes of accidents, and into the many still unexplored regions such as the important one of driver behavior. Many agencies, particularly colleges and universities, could make important contributions by undertaking traffic safety research. The Congress could provide the stimulus for this work through Federal aid as it has done in the highway program and many other Federal-State undertakings.

I thank you.

Mr. ROBERTS. It is our pleasure at this time to ask Dr. Albert C. Chapman, Chief of the Division of Accident Prevention, Public Health Service of the Department of Health, Education, and Welfare, Washington, D.C., to come to the witness stand.

It is with a great deal of pleasure that the Chair welcomes you to the hearing, Dr. Chapman. I know of your own interest in this matter of highway safety. I recognize you as one who has contributed greatly to this field. You may proceed.

**STATEMENT OF DR. ALBERT L. CHAPMAN, CHIEF, DIVISION OF
ACCIDENT PREVENTION, PUBLIC HEALTH SERVICE, DEPART-
MENT OF HEALTH, EDUCATION, AND WELFARE**

Dr. CHAPMAN. Mr. Chairman and members of the subcommittee, you have shown such dedicated interest in the safety of the American people that I want to commend you.

I come here this morning without final position from the Department of Health, Education, and Welfare. This will be prepared and forwarded to you very shortly. In the meantime I may read a statement as Chief of the Division of Accident Prevention.

While H.R. 1341 does not so provide, the House Committee on Interstate and Foreign Commerce, in reporting favorably on a similar bill introduced last year stated, and I quote:

Before any standards are prescribed the Secretary shall give adequate notice to provide all interested persons opportunity to present views and suggestions. It is expected that the Secretary will consult with and consider suggestions from the automobile manufacturing industry, the U.S. Public Health Service,

other Government agencies, expert in the field of medicine and surgery, engineers, experts in the field of safety, and any others that might be of assistance. There is no reason why the requirement made by the Secretary should work any hardship on industry or Government.

The Department, through the Public Health Service is conducting studies in the field of automobile accident prevention and is vitally interested in any method which will help reduce the number of automobile accidents and resulting injuries and deaths.

In 1959 as the record will amply testify there were, approximately, 37,000 fatalities from automobile accidents reported to the Public Health Service national office as vital statistics.

The National Health Survey, published by the Service, estimated that there were 4,172,000 injuries resulting from motor vehicle accidents during that year. This loss of life and injury to persons has made highway accidents one of our leading health and safety problems.

Experts generally agree that the human factor, rather than mechanical inadequacies of motor vehicles is the cause of many accidents. Nevertheless improvements in design and equipment of cars can, to a great extent, compensate for this factor, not only from the point of view of accident prevention, but even more from the standpoint of reducing the severity of injuries when accidents do occur.

Considerable knowledge already exists which, if utilized by motor vehicle manufacturers, would tend to reduce at least the severity of injuries suffered in such accidents. For example, we believe that seat belts, or, at least anchorage for seat belts, should be standard equipment for passenger cars and buses; that seats should so be anchored as to lock them into position; that there should be crash padding of the dashboard, the roof, and other areas of the vehicle, against which passengers might be thrown; that there should be improvement in the steering wheel, in addition to the recessing of the post; and that the interior of the car should, so far as possible, be clear of dangerous knobs, sharp edges, etc.

Such improvements have been strongly supported by safety engineers, research experts, and physicians, for in the report completed by the Department of Commerce, pursuant to section 1117 of the Federal-Aid Highway Act of 1956, it shows that usually the users of seat belts have 60 percent less chance of injury than nonusers who remain in the cars in a crash, and 80 percent less of injuries than nonusers thrown from the car.

To be sure, there are practical limitations. The effectiveness of seat belts as a safety device is a frequent failure of individuals to use them, even if available. However, it seems clear that the adoption of seat belts and other reasonable safety standards by the Federal Government could play an important role in stimulating public demand for safety devices on all vehicles, as well as substantially reducing the severity of injuries resulting from accidents involving federally owned vehicles.

In this connection it should be noted that Federal supply standard 122, promulgated by the General Services Administration, provides an option under which agencies may order seat belts in motor cars.

Recently, the automobile manufacturers indicated that anchorage of seat belts in the front seat would be standard feature in the 1962 car models. This important first step would facilitate installation of such seat belts in any passenger automobile whether or not purchased by the Federal Government. If, however, in line with the desirable

objective of this bill the Federal Government is to provide effective leadership in promoting safety devices by its example, then any action toward this end should begin with adequate provision for financing the acquisition of the additional equipment indicated.

The present \$1,500 statutory cost limitation for passenger cars and \$1,950 for station wagons, currently specified in Public Law 86, section 201, has been held to include the original cost of the vehicle as well as all equipment or accessories which are currently attached. That is, permanently attached to and becoming a part of the vehicle, and which contributes to the comfort and convenience of the passengers and the operation of the passenger-carrying vehicle. Thus it is apparent that the current cost limitation makes it virtually impossible for the Federal Government to install any additional equipment that might carry useful safety purposes, or to purchase models incorporating certain safety features in their design, notwithstanding the basic authority of the General Services Administration to amend procurement standards so as to require or permit such safety equipment or features. We, therefore, suggest the desirability of exempting such safety features or devices from the ceiling on the purchase price of Government cars, or by appropriately adjusting or removing the ceiling. Once the price barrier is removed the choice between leaving achievement of the bill's objective entirely to executive initiative or, on the other hand, enacting a legislative mandate is, from our point of view, a lesser consideration. However, whether in connection with action on the dollar ceiling or otherwise, it would seem appropriate that Congress should make clear that Federal leadership is here the incorporation in specifications for Government cars of special requirements of safety features in nonstandard and passenger automobiles produced for the general market and is considered compatible with the overall objective of economy in Federal procurement operations.

In the event that the committee believe it necessary to further supplement existing procurement authority through legislation along the lines of H.R. 1341 then, in addition to a revision of the present dollar ceiling as above indicated, some technical revision of the present bill might be desirable.

One, the bill would provide that no motor vehicle manufactured on or after the effective date of this section shall be acquired by purchase by the Federal Government unless such motor vehicle is equipped with such reasonable safety devices as the Secretary of Commerce shall require.

The clear implication of this language is that prescribed safety devices should be mandatory equipment on vehicles at the time of purchase of the vehicles by the Federal Government.

While this is desirable in general, an inflexible requirement of this kind would, for instance, prevent the immediate utilization of safety devices where available in the form of accessories and subassemblies until such time as structural changes necessary for the best placement of the safety device on a new vehicle can be made by the manufacturer.

Further, we question whether 2 years and 90 days, the maximum time allotted by the bill for the automobile industry to meet the initial standards promulgated under the bill, would prove adequate in certain instances. An approach emphasizing flexibility as to both

how and when safety devices may be installed would seem likely to yield the best results.

We assume that consideration will, also, be given to the feasibility providing for the addition of certain equipment; for example, safety belts to vehicles already owned and operated by the Federal Government at the time of the enactment of the bill.

On the question of whether, if legislation along the lines of H.R. 1341 is favorably considered, the Secretary's responsibility for the promulgation of safety standards should be lodged in the Department of Commerce, proposed by the bill, or in the General Services Administration, as under existing procurement law, or elsewhere, I have no recommendation to make as to that.

I will be happy to answer any questions you might ask.

Mr. ROBERTS. Thank you, Dr. Chapman. I appreciate your very fine statement.

If I recall, you testified on similar legislation before the subcommittee of the Senate last session.

Dr. CHAPMAN. That is right.

Mr. ROBERTS. I believe that at that time the Department of Health, Education, and Welfare reported favorably on that legislation?

Dr. CHAPMAN. That is right.

Mr. ROBERTS. I noted from what you had to say about the legislation that 2 years and 90 days might not be sufficient for preparing to add these devices to cars as standard equipment. Will you give us your thinking along that line? How much additional time do you think might be required?

Dr. CHAPMAN. I believe that depends on the complexity of the change in design that might be required by a proposed safety feature. In other words, the features that have been proposed to date have been relatively simple and I think do not fall in this category, but there might be revolutionary new design features that would require considerable remodeling of the basic car design which, conceivably, could require more than this period of time.

Mr. ROBERTS. At the present time do you think that it would require additional time to add such devices as crash pads, recessed steering wheels, and overhead sections in the form of additional crash padding and padding on, say, the visors? Would that require additional time?

Dr. CHAPMAN. No, sir.

Mr. ROBERTS. Do you think that most of that type of device about which we already know is either on the drawing boards or is offered as optional equipment now, would add greatly to the initial cost of the car?

Dr. CHAPMAN. That is a relative question. I feel, however, that safety is as important a feature for a consumer to purchase as is power or the ability to move from one place to another. In other words, safety is as logical and reasonable to be paid for as for horsepower or appearance or any other quality that we purchase when we buy an automobile.

Mr. ROBERTS. Relative to what the changes will cost the American public, a survey was made by your Department under the authority of the act of 1956, was it not, with reference to the cost of injuries?

Dr. CHAPMAN. Yes.

Mr. ROBERTS. Will you elaborate a little on the number of injuries, give us some estimate of the costs of hospital and doctor fees, drugs, insurance premiums and the like? Please give us a little information on that.

Dr. CHAPMAN. I can give you some of that. The remainder I would like permission to incorporate in the record.

Mr. ROBERTS. You may do so without objection.

(The information follows:)

It is estimated that the total cost of motor vehicle injuries in 1959 was \$4.1 billion. These costs include \$1.6 billion in wage loss, \$150 million in medical expenses and \$2.4 billion overhead costs of insurance. In addition to these costs of injuries, the estimated cost of property damage in motor vehicle accidents was \$2.1 billion, resulting in an overall cost of \$6.2 billion.¹

Dr. CHAPMAN. In addition, I would like to give you some general figures. Each year, as has been testified, accidents kill more than 90,000 in the United States. There were 92,080 killed in 1959. They, of course, have become the fourth leading cause of death in the total population.

The first cause of death in all age groups, from 1 to 35.

Forty percent of these deaths are due to motor vehicle accidents, that is, a total of 37,910 in 1959.

The National Health Survey shows that there were 46 million injured annually in their most recent estimate. More than one person in four is injured every year; 38 million of these received medical care; 10 million incur a bed disabling injury; and 1.7 million require intake into hospital for care.

Each year injuries result in about 424 million days of restricted activity; 114 million days of bed disability; and 107 million workdays lost.

In 1959 in an estimate of the accident burden, Hospital Bulletin 104 of the American Medical Association, shows there were 50,000 beds required to care for accident victims in that year. Of course, this rises each year.

In 1959 the estimated expenditures for accidents was \$13 billion. These are the kinds of figures that have been given concerning the financial burden caused by accidents in the United States. It is a tremendous figure.

Mr. ROBERTS. Those are all of the questions I have. I thank you, Dr. Chapman.

Mr. Schenck of Ohio?

Mr. SCHENCK. I want to join the chairman in commending you on the presentation you have made.

I notice that you have said that the Department of Health, Education, and Welfare will have a statement sent to the committee in the near future.

Dr. CHAPMAN. Yes, sir; very shortly.

Mr. SCHENCK. You referred in your statement to the fact that human failure was causing a large percentage of the fatal accidents and the nonfatal accidents.

Dr. CHAPMAN. Yes, sir.

Mr. SCHENCK. Rather than mechanical defects or car construction. I am wondering upon what you base that sort of figure.

¹ Source: Estimates by National Safety Council, Accident Facts, 1961 (p. 13).

Dr. CHAPMAN. In the last 3 or 4 years the Public Health Service has had increased funds for accident prevention research. This has increased from about \$86,000 in 1956, to the present figure of \$1,482,000.

A growing amount of these research funds is being sent to support research to validate this very assumption or hypothesis. In other words, we believe that driver education will so condition a young man or young woman that when he or she drives a car he or she will drive within the limits of the car's capacity to behave, and with their own physical, physiological, and psychological limitations.

Other studies are being mounted to see what effect there is on persons who have had moving violations by referring them to traffic schools or to group therapy situations, to see whether it will so change attitudes that they will continue then, after this experience, to behave in a safe manner while driving cars. In other words, the modern car, although it, certainly, can be improved from the viewpoint of safety, is capable of being handled safely in most situations by most people. The greatest difficulty is when people exceed their own limitations or ask more of the car than the car has to give. And a great deal of research must be done to thoroughly and scientifically evaluate these limitations and how we can improve the performance of the individual.

Mr. SCHENCK. That is from the standpoint of overdriving?

Dr. CHAPMAN. Yes, sir.

Mr. SCHENCK. I assume, Dr. Chapman, that part of your research work is being done by various grants?

Dr. CHAPMAN. Yes, sir.

Mr. SCHENCK. Including such studies as, perhaps, are still going on at Harvard?

Dr. CHAPMAN. Yes sir.

Mr. SCHENCK. Were they not approached from the standpoint of single car accidents caused from single car accidents?

Dr. CHAPMAN. That is right. There are so many variables in an accident situation that to do research work on it you try to get the simplest situation to begin with, and even then it is very complex.

Mr. SCHENCK. You are approaching it from the standpoint which is much the same as the various agencies having to do with aircraft movements?

Dr. CHAPMAN. I think a great deal can be garnered by that approach.

Mr. SCHENCK. Yes sir. As I recall it was your department which was quite interested in encouraging the construction of so-called simulators that are being used in connection with the various driving courses throughout the country?

Dr. CHAPMAN. Yes sir.

Mr. SCHENCK. Is that still going forward?

Dr. CHAPMAN. We held a national congress on simulation. And when I say we, I mean the Automotive Safety Foundation, Bureau of Public Roads, and the Public Health Service of the Department of Health, Education, and Welfare. It was held in Santa Monica, Calif., in February. There was great enlightenment on the part of the professional people there concerning the value of, the need for, and the use of high fidelity simulation devices that could be used for research

concerning all phases of driving situations, not only human behavior, but, also roadway design and car design.

Mr. SCHENCK. You feel that such equipment is very helpful?

Dr. CHAPMAN. I think it would solve many of our problems in a much shorter time than if we did not have it.

Mr. SCHENCK. Do you think that there is a greater degree of exchange of information and cooperation among the departments of government today, and that there is no overlapping in the cost?

Dr. CHAPMAN. The needs are so great, sir, that the problem is the lack of resources in terms of manpower, funds, and so forth, rather than duplication. I believe I know of no serious area of duplication or overlapping, but a growing amount of interdepartmental cooperation is evident.

Mr. SCHENCK. They are going forward with a great deal of efficiency?

Dr. CHAPMAN. Yes.

Mr. SCHENCK. Further in your testimony you indicated that the dollar ceiling cost at the present time of automobiles purchased by the Government does not make provision for these extra safety devices; therefore, as I recall it, you recommended that the cost of these devices be permitted above and beyond the limitations for the purchase cars.

Dr. CHAPMAN. That would seem reasonable, sir.

Mr. SCHENCK. I was wondering, therefore, whether or not you have any comparable figures available as to the cost to the Federal Government resulting from injuries and loss of time of Federal employees as compared to the cost of these additional safety features or additional safety equipment?

Dr. CHAPMAN. I think that can be provided for the record, Mr. Schenck.

Mr. SCHENCK. Will you do so?

Dr. CHAPMAN. Yes.

Mr. SCHENCK. Thank you very much.

Mr. ROBERTS. That information will be made a part of the record at this point without objection.

(The information follows:)

Vehicular work injuries sustained by Federal employees—Calendar year 1957

Fatal	47
Nonfatal	2, 278
Average cost to the Government of each fatality.....	\$37, 900. 00
Average cost to the Government of each nonfatal injury.....	\$379. 37
Contract price to the Government of a seat belt (without installation).....	\$3. 18
Number of Government motor vehicles as of June 30, 1960 (not including troop vehicles and buses of the Department of Defense):	
Sedans.....	37, 995
Station wagons.....	7, 945

Mr. ROGERS of Florida. I have enjoyed your testimony this morning, Dr. Chapman. I wonder if you could give Mr. Thompson and me a little background. I am not as familiar with this subject as Mr. Roberts and Mr. Schenck. Familiar, that is, with all of the functions of your group in the Department. Therefore, Mr. Thompson and myself might be helped if you would tell us the functions of your particular division, the amount of your budget, and the number of personnel you have.

Dr. CHAPMAN. Yes, sir.

About 4 years ago the American Public Health Association and the Public Health Service, were confining their interests primarily to home safety. Since that time there has been a broadening of interest and a change of policy, so that our interest in accident prevention is an across-the-board one on the principle that accidents all have a common denominator. In other words, if a person is crippled they may have an automobile accident. They may fall down stairs. Or they may have an accident at work.

So that in our research we are interested in the basic causes of accidents rather than just the superficial causes.

This broadened our interests to include research and studies in the entire accident prevention field.

Certainly, the charter of the Public Health Services is directed, primarily, toward State and local health departments. This has permitted an entree on a broader scale to the medical and scientific professions. In other words, an example I might give is the cooperation of the State Health Officers with the motor vehicle administrations in mobilizing State medical societies to form committees that will assist in evaluating the driving ability of epileptics, persons with heart diseases, those with arthritis, etc.

So, primarily, we are interested in doing safety research which applies to underlying causes of accidents.

And, secondly, to assist State and local health departments to engage more cooperatively in the entire field of accident prevention with State and local agencies and to stimulate interest and to encourage the entrance of the medical and associated professions into the field of accident prevention wherever possible.

Mr. ROGERS of Florida. What is your budget?

Dr. CHAPMAN. Our budget for this year—I can only give you that in rough terms.

Mr. ROGERS of Florida. That will be all right.

Dr. CHAPMAN. It is approximately \$3 million. That includes \$1,482,000 for basic research which was included in our budget for the first time this year, that is in the 1962 budget.

Mr. ROGERS of Florida. How many personnel work under you?

Dr. CHAPMAN. We have a budget in 1961 that will permit the employment of 122 persons. This does not include the persons employed under research grants.

Mr. ROGERS of Florida. Approximately how many personnel would you say are under research grants?

Dr. CHAPMAN. I could not give you that figure.

Mr. ROGERS of Florida. Will you supply that for the record?

Dr. CHAPMAN. Yes, sir.

Mr. ROBERTS. That will be made a part of the record at this point.

(The information follows) :

Number of personnel employed in accident prevention research projects supported with PHS funds, Mar. 1, 1961

	Full time	Part time
Traffic.....	62	95
Other than traffic:		
Poisoning.....	2	
Farm.....	1	5
Home.....	1	
Childhood.....	14	6
Athletic.....	2	1
Aviation.....		26
Total.....	82	133

Mr. ROGERS of Florida. And the type of research projects?

Dr. CHAPMAN. We have 33 of those projects underway now.

Mr. ROGERS of Florida. How many of the personnel that you have are actually engaged in research for automobile safety?

Dr. CHAPMAN. The types of research we do, other than the basic research, is what we call applied research.

We have about 28 people who are doing, in some way or other, epidemiological studies, statistical analysis dealing with the whole field of accident prevention and improving automotive safety.

Mr. ROGERS of Florida. Do you have anyone devoting his time and effort to working on safety features for automobiles, would you say?

Dr. CHAPMAN. We have one position and one safety expert and a small staff that is engaged, primarily, in various areas of traffic safety. It is an extremely small operation. We do, however, work cooperatively with many other committees, groups, agencies, and organizations in taking part in these broader activities.

Mr. ROGERS of Florida. I realize that. I wanted to know what the actual budget is. That is, the actual number of personnel in the Department of Health, Education, and Welfare who have as their main purpose research on safety features for automobiles.

Dr. CHAPMAN. I would say that there are none, except in the research grant area.

Mr. ROGERS of Florida. And can you furnish for the record those figures?

Dr. CHAPMAN. Yes, I can, sir.

Mr. ROBERTS. That will be made a part of the record at this point, without objection.

(The information follows:)

STATEMENT

As of March 1, 1961, there were approximately 29 full-time and 32 part-time employees of research projects supported with PHS funds which have as their main purpose research on safety features for automobiles.

Mr. ROGERS of Florida. Otherwise, you say it is practically nothing?

Dr. CHAPMAN. Yes, sir.

Mr. ROGERS of Florida. Who do you feel should handle safety research for automobiles if we decide that the Federal Government should do more work along this line? What would be your recommendation as to that? Do you have any feeling on the subject?

Dr. CHAPMAN. I feel that the Public Health Service has a unique capacity, through its research grant mechanism, to perform a great deal of this type of research, but I would not feel competent to say that all of the research or any considerable part of it should be limited to the Public Health Service area.

Mr. ROGERS of Florida. Do you feel there is an area there where such work could be done?

Dr. CHAPMAN. Yes, sir. It has proven itself in other areas such as disease, heart, cancer, mental illness, and so forth. There is no reason why the same mechanism is not equally as effective in studying the basic cause of accidents.

Mr. ROGERS of Florida. As I recall, you gave figures generally for accidents overall?

Dr. CHAPMAN. Yes, sir.

Mr. ROGERS of Florida. There were some 40-million-odd?

Dr. CHAPMAN. That is right, 46 million persons injured.

Mr. ROGERS of Florida. And there were 90,000 deaths in accidents?

Dr. CHAPMAN. That is right.

Mr. ROGERS of Florida. Of which 40 percent—

Dr. CHAPMAN. Forty percent, yes, were motor vehicle deaths.

Mr. ROGERS of Florida. Well, automobiles?

Dr. CHAPMAN. Yes, sir, that is right.

Mr. ROGERS of Florida. Would you say that 40 percent of the personnel you have working on research, on accidents, are devoting their time to phases of automobile accidents?

Dr. CHAPMAN. No, sir, but I would say that the percentage is growing as the Public Health Service and other public health groups are accepting the policy or the philosophy that accidents have a common base. And, therefore, a study of the basic causes of traffic accidents are as important as studying the basic causes of home safety and home accidents and farm accidents and so forth.

Mr. ROGERS of Florida. What I am trying to point up is whether you have neglected the field. It has been shocking to me to find so little research when 40 percent of the causes of the accidents are caused by automobiles, and here we have practically no work being done on safety features on automobiles.

I think this is something that presents a very grave challenge to this subcommittee, Mr. Chairman, to get into this whole field.

We had a representative from the Department of Commerce the other day who came here to testify. We were surprised to find out how little was being done on the approach to that particular subject before us. The chairman indicated that it was very difficult to even find a policy. It was hard to get the Department to say how they even felt about these matters.

Your statement that they had been encouraging, though we have not had an official departmental report, is surprising to me. I do not see how we can make this decision unless each department will come up at a time we ask for the information and present it. I realize that that is not your responsibility, but the more we go into this

problem of safety the more I am amazed as to how little we are doing, how much needs to be done, and how little emphasis has been placed on this subject. There is a crying need for some more work in research to be done in this field. I am very hopeful, and I have talked to the chairman about this matter, that we can really go into this a great deal more and to have the Secretary come here and see if we cannot work out an effective research program to cut down one of the major causes of death in this field.

Dr. CHAPMAN. Thank you.

Mr. ROBERTS. I would, certainly, like to commend the gentleman from Florida on the very fine statement he has just made. It gives the Chair a lot of encouragement. I hope that we can place this problem in its proper perspective.

I might mention that I think that during the hearings a few years ago a department of the industry stated that relatively speaking we were spending no money in research in this field. I think he used this comparison, that we were spending about 70 cents per injury and about \$2.50 per death, whereas in the field of polio we were spending at the rate of \$10,000 per injury, and I believe in some cases it is as much as \$20,000 per fatality in that field. And yet you can see how much we have accomplished in the one field and how little we have accomplished in the other field.

We recognize, too, that in the people who have the most to give, the most to hope for, the young people, those up to age 24, traffic accidents is the greatest killer of all. These young people are going to take over the reins of leadership and they will be our leaders in the professions, in the sciences, and in all of the other fields. And here they are being taken away before they have a chance to give us any contribution from their education and the effort that has been spent in trying to educate them.

It is very discouraging.

This is not any criticism of you, Dr. Chapman, or your Department. It is, however, very discouraging to this subcommittee to have happen what happened here last Friday when the Department of Commerce came up without any investigation into the matter and without any recommendation as to a rather small step, that of trying to establish some standard as to a product in interstate commerce, so as to protect the consumers.

I would like, also, to commend you for the fine work you have done in this field. I know you have been one of the people who have spent a lot of time and effort in this field, and one who has a lot of ability.

Mr. THOMSON. Mr. Chairman, I have the impression that the most dangerous place to be was in your home or on your way to work—that was the most accident-prone situation. What has been the improvement as to accident prevention as between the home, the highway, and industry?

Dr. CHAPMAN. In that we have had a strong motivation to improve the accident prevention situation because of the high costs involved in work loss. I have a chart before me which shows the death rates from work accidents in manufacturing.

The accidents from 1935 to 1957 dropped from 25 per hundred thousand workers to 11. This is a very definite improvement and by far the greatest improvement that we have noted.

In home accidents there has been a decreasing number of deaths per hundred thousand.

In deaths from ingestion of poisonous substances there has been a decrease.

But in the case of the automobile, while there has been a decrease in the number of deaths per hundred million miles traveled, the increase in the growth of population, the increased number of cars, and the increased number of miles traveled, has neutralized the decrease in the mileage death rate, so that we have held approximately the same level of total annual motor vehicle deaths.

There is one statistic, it seems, that should be noted, that is, that although deaths per motor vehicles, led the list, the injuries from home accidents exceed the injuries from automobile accidents; in other words, there are many more minor injuries in the homes. Automobile injuries tend to be more often fatal and more severe than home injuries.

Mr. THOMSON. Do you have charts available to put in the record?

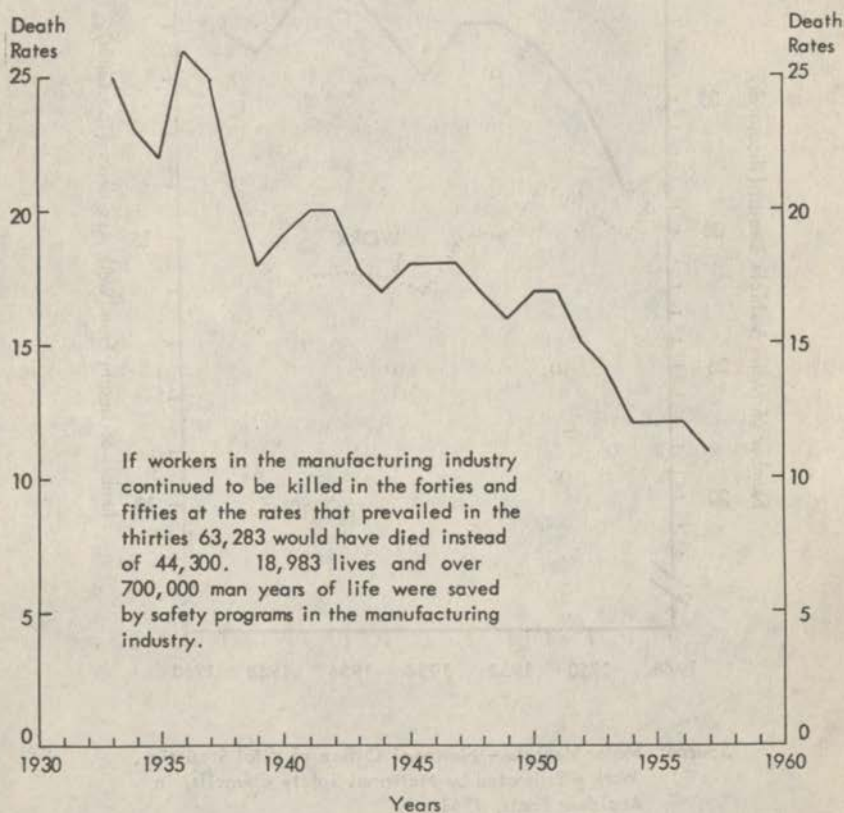
Dr. CHAPMAN. Yes, sir.

Mr. THOMSON. I would like to have them inserted.

Mr. ROBERTS. Without objection, that will be made a part of the record.

(The charts follow :)

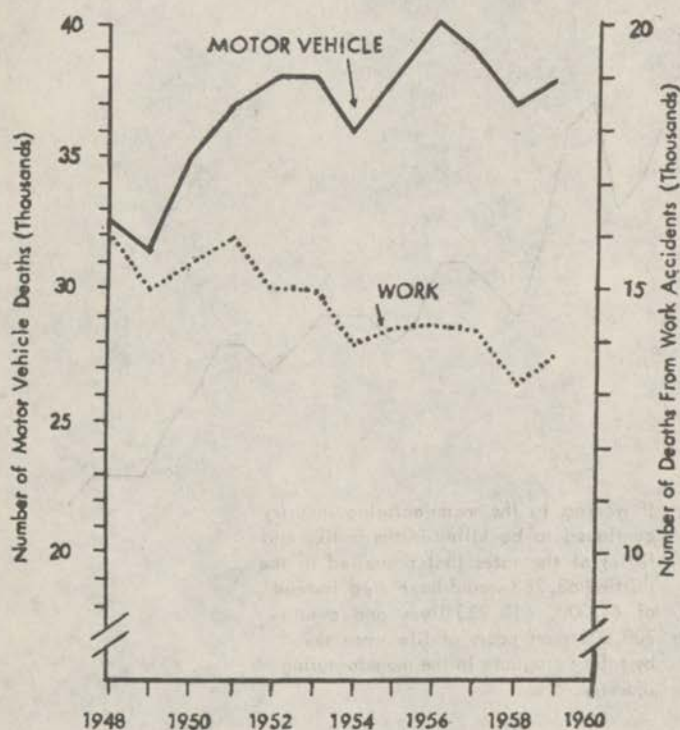
DEATH RATES FROM WORK ACCIDENTS
(rates per 100,000 workers)
MANUFACTURING INDUSTRY - UNITED STATES 1933-1957



DHEW-PHS Accident Prevention Program
Division of Special Health Services
January 1959

DEATHS FROM MOTOR VEHICLE ACCIDENTS AND FROM WORK ACCIDENTS

United States, 1948-1959

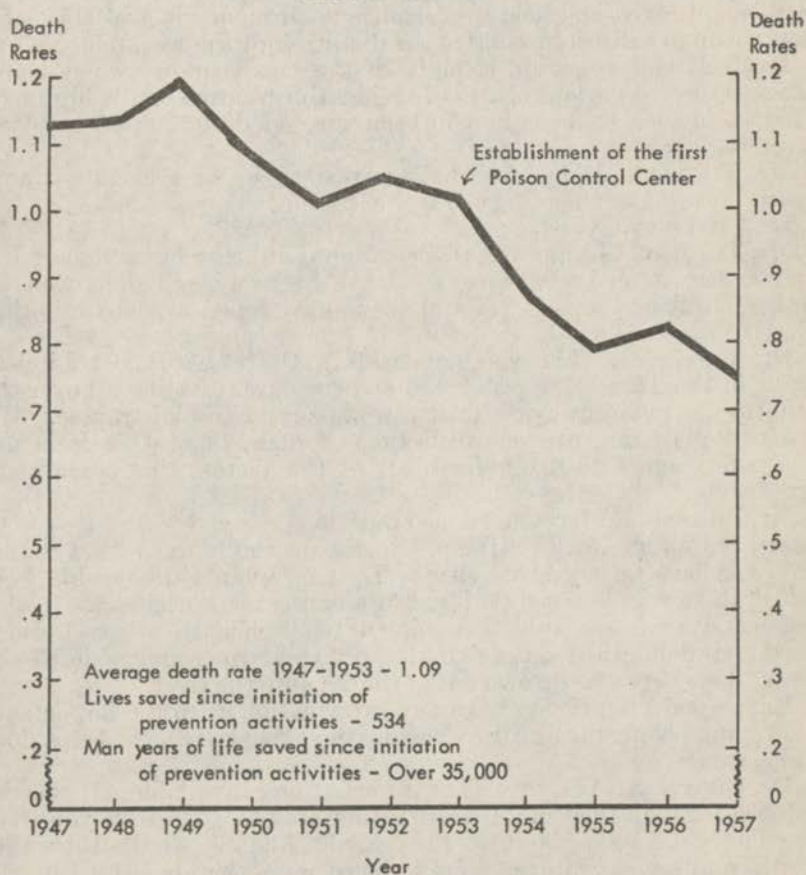


Source: Motor Vehicle - National Office of Vital Statistics.
Work - Estimated by National Safety Councils, in
Accident Facts, 1961

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Accident Prevention
February, 1961

DEATH RATES FROM INGESTION OF POISONOUS SUBSTANCES,
PERSONS UNDER FIFTEEN YEARS OF AGE
(rates per 100,000 population)

United States 1947-57



DHEW-PHS Accident Prevention Program
Division of Special Health Services
January 1959

Mr. THOMSON. How extensive is your research—do you go into the same in regard to trailer accidents?

Dr. CHAPMAN. The basic research that is done is oriented to the interest of the research workers; in other words, research workers from any place in the United States can apply for a grant. The validity of the research, the ability of the man who is doing it, and the thing at which he is aiming in the research is evaluated. On the basis of these factors, he is either granted the money or he is not granted the money. If money is not granted, the research project may be approved and held in abeyance until money is available. So that we do not direct or control the direction of the research.

Much of this research, though, in the last year or two is being directed toward various phases of accident prevention on the highway. That is, in such fields as human behavior, car design, crash injuries, et cetera.

Mr. THOMSON. Would you have any statistics on accidents caused by the breaking or the failure of trailer hitches?

Dr. CHAPMAN. No, sir.

Mr. THOMSON. I know one trailer hitch that broke last summer, and the trailer came down the side of the highway and destroyed an entire family of people. I would like to have somebody look into that phase of it.

Dr. CHAPMAN. This has happened in the case of boat hitches. Many of them are being purchased and they are traveling all over the country on the highways. That is a potential cause of trouble. We are trying to improve our collection of data, but as yet it is not adequate enough to bring forth all of the factors that we are interested in.

Mr. THOMSON. I have no further questions.

Mr. SCHENCK. Mr. Chairman, I just want to say this. Last Saturday, I believe, in my home city of Dayton, Ohio, three people were killed, three very seriously injured in an automobile accident. In this accident the car, I am told, was going at too high a rate of speed. This particular boulevard on which this occurred runs alongside of the river. One lady was thrown out of the car into the river.

I am wondering if you have any information as to the importance of keeping people in the car by various devices, such as seat belts, door locks, et cetera?

Dr. CHAPMAN. Yes, sir. That information is available. It was developed through the Cornell crash injury studies. The data you want previously has been placed on the record. Reliable studies show that deaths and serious injuries were reduced more than one-third by the use of seat belts. This is a very conservative statement.

Mr. SCHENCK. Would you say that they were reduced by one-third by the use of the seat belts?

Dr. CHAPMAN. Reduced by one-third, yes, sir.

I just read in the paper this morning of a man who was killed out in the country by being thrown out of the car. I very often ask people if when they pick up their morning paper and see a story about a car fatality they will note how often it says that the person was thrown out of the car and killed. I think that this is a very conservative estimate.

Mr. SCHENCK. Of course, that is based on the fact that if a car is going at any rate of speed, say, for instance, 30 miles an hour and is stopped suddenly by hitting some other object, the people in the car continue to go at the rate of 30 miles an hour in the car?

Dr. CHAPMAN. Yes, sir.

Mr. SCHENCK. Until they stop.

Dr. CHAPMAN. Yes, sir.

Mr. SCHENCK. So if anything slows up their movement it would be easier on them and would be a very definite safety factor?

Dr. CHAPMAN. Yes. A seat belt would permit the engineer to so design the area of head impact that the forces will be spread. There will be much less chance for head fracture.

Mr. SCHENCK. Has your research developed any information as to the kind and quality of padding that is necessary in these crash pad areas?

Dr. CHAPMAN. There has been research there.

Mr. SCHENCK. Foam rubber, I understand, is insufficient—it is not firm enough—is that your understanding?

Dr. CHAPMAN. That is my understanding. There are variations in quality, in the shock absorbing qualities between various substances.

Mr. SCHENCK. And that is important.

Dr. CHAPMAN. That is extremely important.

Mr. SCHENCK. Thank you. That is all.

Mr. ROBERTS. Dr. Chapman, I have one more thing before you leave. Right after you finished your testimony, I asked if the Department last year had approved this bill at the Senate hearings, and I believe your answer was that it had?

Dr. CHAPMAN. Yes.

Mr. ROBERTS. I have a statement by the Honorable Arthur S. Flemming, then Secretary of the Department of Health, Education, and Welfare. I think it would be of interest to have it included in the record at this point.

It is a letter from Secretary Flemming to Senator Magnuson. And without objection I would like to include that following the testimony of Dr. Chapman. Again, I would like to thank you.

(The letter follows:)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
May 31, 1960.

HON. WARREN G. MAGNUSON,
Chairman, Committee on Interstate and Foreign Commerce,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: This letter is in response to your request of September 9, 1959, for a report on H.R. 1341, a bill to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

This bill would forbid purchase of passenger-carrying motor vehicles (except certain military vehicles) for use by the Federal Government unless they are equipped with such reasonable safety devices as the Secretary of Commerce shall require, and such devices are in conformance with commercial standards prescribed by him. The standards first established would have to be prescribed and published not later than 1 year after enactment of the bill, but the prohibition against purchase of automobiles not meeting the Secretary's requirements would apply only to vehicles manufactured on or after the expiration of 1 year and 90 days after publication of the Secretary's initial standards. The effective date of any changes in such standards would be deferred for a like period after publication.

While the bill does not so provide, the report of the House Committee on Interstate and Foreign Commerce in reporting favorably on this bill states:

"Before any standards are prescribed, the Secretary should give adequate notice and provide all interested persons opportunity to present views and suggestions. It is expected that the Secretary will consult with, and consider suggestions, from the automobile manufacturing industry, the U.S. Public Health Service, other Government agencies, experts in the field of medicine and surgery, engineers, experts in the field of safety, and any others who might be of assistance.

"There is no reason why the requirements made by the Secretary should work any hardship on industry or the Government" (H. Rept. 715, p. 6).

This Department—which, through the Public Health Service, is conducting studies in the field of automobile accident causation and prevention—has a vital interest in any method which will help to reduce the number of automobile accidents and resultant injuries and deaths. In 1957 there were approximately 38,500 fatalities from automobile accidents reported to the Public Health Service's National Office of Vital Statistics. The National Health Survey, published by the Service, estimated that there were 4,700,000 injuries resulting from motor vehicle accidents during that year. This loss of life and injury to persons has made highway accidents one of our leading health and safety problems.

Experts generally agree that the "human factor," rather than mechanical inadequacies of motor vehicles, is the cause of most accident. Nevertheless, improvements in design and equipment of cars can to some extent compensate for this factor, not only from the point of view of accident prevention but, even more, from the standpoint of reducing the severity of injuries when accidents do occur.

Considerable knowledge already exists which, if utilized by motor vehicle manufacturers, would tend to reduce at least the severity of injuries suffered in such accidents. For example, we believe that seat belts, or at least anchorage for seat belts, should be standard equipment for passenger cars and buses; that seats should be so anchored as to lock them into position; that there should be crash padding of the dashboard, roof, and other areas of the vehicle against which passengers might be thrown; that there should be improvements in the steering wheel in addition to recessing of the post; and that the interior of the car should, so far as possible, be cleared of dangerous knobs, sharp edges, etc.

Such improvements have been strongly supported by safety engineers, research experts, and physicians. Information in the study recently completed by the Department of Commerce pursuant to section 117 of the Federal-Aid Highway Act of 1956 showed that users of seat belts had 60 percent less chance of injury than nonusers who remained in the car in a crash and 80 percent less chance of injury than nonusers who were thrown from the car. To be sure, a practical limitation to the effectiveness of seat belts as a safety device is the frequent failure of individuals to use them, even if available. However, it seems clear that the adoption of seat belts and other reasonable safety standards by the Federal Government could play an important role in stimulating public demand for safety devices on all vehicles, as well as substantially reducing the severity of injuries resulting from accidents involving federally owned vehicles.

The Federal specification governing procurement of vehicles by the Federal Government is presently prescribed by the Administrator of General Services pursuant to his authority under sections 201(a) and 206(a) of the Federal Property and Administrative Services Act of 1949. Federal Supply Service Standard 122, published by the GSA pursuant to such authority, specifically outlines standard purchase requirements. Standard 122 makes no provision for the mandatory use of proven safety devices not now standard equipment on motor vehicles. (Provision is made for the optional use of seat belts.) The GSA's specification for vehicles, however, is a minimum requirement rather than an optimum standard. The emphasis in procurement policy is to acquire vehicles "at the lowest prices obtainable" which will "adequately perform the services required." Hence, the mandatory requirements relate only to such items as are standard equipment on all vehicles. This is also made necessary by the present statutory cost limitation of \$1,500 for passenger cars and \$1,950 for station wagons (see Public Law 86-79, sec. 201). The initiative for developing new safety devices and making them available on vehicles thus rests primarily with the industry.

We believe that, in line with the objective of this bill, the Federal Government should exercise more responsibility and leadership in developing—in consultation with interested industry and other groups mentioned in the House committee report (H. Rept. 715, p. 6)—appropriate safety devices and standards therefor, and that, at this time, legislation would be desirable to require that vehicles purchased by the Federal Government for its own use incorporate devices so developed. Such a requirement would, in turn, promote the manufacture and use of safer motor vehicles generally.

Some revision of the present bill seems desirable, however.

If the Federal Government is to provide effective leadership in promoting the use of safety devices by its example, than any legislation toward this end must make adequate provision for financing the acquisition of the additional equipment indicated. The above-mentioned statutory cost limitation, uniformly has been held to include the original cost of the vehicle as well as all equipment or accessories which are permanently attached to and become a part of the vehicle and which contribute to the comfort and convenience of the passengers and the efficient operation of the vehicle as a passenger-carrying vehicle (19 Comp. Gen. 988, 990; 36 Comp. Gen. 726). Thus, it is apparent that the current cost limitation makes it virtually impossible to install any additional equipment which might serve useful safety purposes. We would, therefore, urge the committee to consider revising the bill in order to permit effective implementation of its objectives.

Also, the bill would provide that "no motor vehicle manufactured on or after the effective date of this section shall be acquired by purchase by the Federal Government * * * unless such motor vehicle is equipped with such reasonable safety devices as the Secretary of Commerce shall require * * *." The clear implication of this language is that prescribed safety devices should be mandatory equipment on vehicles at the time of the purchase of the vehicles by the Federal Government. While this is desirable in general, an inflexible requirement of this kind would, for instance, prevent the immediate utilization of safety devices where available in the form of accessories or subassemblies until such time as structural changes necessary for best placement of a safety device on a new vehicle can be made by the manufacturer. Further, we question whether 2 years and 90 days, the maximum time allotted by the bill for the auto industry to meet the initial standards promulgated by the Secretary of Commerce, will prove adequate in certain instances. An approach emphasizing flexibility as to both how and when safety devices may be installed would seem likely to yield the best results.

Finally, we assume that consideration will also be given to the feasibility of requiring the addition of certain equipment (e.g., safety belts) to vehicles already owned and operated by the Federal Government at the time of the enactment of the bill.

We urge that the Federal Government provide needed leadership in stimulating acceptance of proven safety devices. Subject to the modifications suggested above we, therefore, recommend enactment of H.R. 1341.

The Bureau of the Budget advises that it perceives no objection to the submission of this report to your committee.

Sincerely yours,

ARTHUR S. FLEMMING, *Secretary*.

Mr. ROBERTS. We have the Honorable Charles E. Bennett of Florida, who has introduced a bill in this field, that all cars be equipped with certain safety devices. It is a real pleasure and a privilege for the Chair to welcome Mr. Bennett to our hearings. We will be glad to hear from you now.

STATEMENT OF HON. CHARLES E. BENNETT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. BENNETT. Mr. Chairman and members of the committee, let me thank you for the fine work in the past in spearheading this effort which, I think, is very much needed.

When I spoke here in 1959 for my bill to require certain safety devices on motor vehicles, I said it was totally unrealistic to expect automobile manufacturers to voluntarily provide safety features needed on their cars. I confess I overstated my case—but not by very much. On February 24 of this year the major car manufacturers—Ford, General Motors, Chrysler, American Motors, and Studebaker-Packard—made an announcement I found gratifying. They said seat belt hardware—the floor pan anchorage for belts—will be installed as standard equipment on their 1962 models.

Those of us who have been urging such action for several years naturally wondered how the car manufacturers overcame their earlier resistance to providing seat belt installations on anything other than an optional basis. The announcement of the new policy came at the end of a 2-day visit to Detroit by a group of New York State officials, most of them members of the State legislature. The chairman, State Senator Edward J. Speno, had described the groups' mission as a "showdown trip" on a pending bill that would require the seat-belt hardware on all cars registered in New York after June 30, 1962.

In other words, the car manufacturers decided to do voluntarily what they had reason to believe they would soon be forced to do—at least for cars sold in New York. I don't want to disparage what these companies have done, and in fact I want to praise them for a policy which I believe will save some lives.

But legislation to require safety devices in cars is needed to get the job done as it should be done. As I and others have pointed out before this subcommittee, safety devices such as seat belts have only a negative appeal, if any appeal at all, for most car buyers. If the manufacturers weren't sure of this, they would have decided to go beyond installing the seat-belt hardware and would provide the seat belts as well. As it is, the car buyer will buy the belts as an optional feature, if he can be made to realize that it may be worth his life to do so. Most will not be so persuaded. There were an estimated 1½ million serious, critical, and fatal traffic accidents in 1960; and the number this year probably will be greater. When we have it on good authority that these deaths and injuries could be reduced by 35 percent by the widespread use of safety belts alone, it's surely unwise to wait for everyone who uses our highways to finally awaken to the importance of getting this lifesaving equipment.

I agree with the statement someone made that motorists not be given the choice of not having the safety belt any more than they are given the choice of buying uninspected meat.

The need is plain. Seat belts should be mandatory on every car sold. The same is true of certain other safety features—the padded dashboard, the recessed steering wheel post, to name a few. This isn't to downgrade the importance of driver education. When every new car comes equipped with a seat belt there still will be a great need to persuade people they should use them. My point is that the whole job shouldn't be left to education. If a car buyer gets safety belts along with his windshield wiper and horn, as standard equipment required by law, then it will be easier to teach him to use them.

It is hard for me to understand how providing necessary safety features would make a significant difference in the cost of new auto-

mobiles and success in selling them. According to an article in the New York Times on March 5 of this year, to produce the hardware for seat belts will cost less than 40 cents a car—this would be the anchorage for four belts, two for the front seat, and two for the rear. Good web belts, that meet the standards of the Society of Automotive Engineers, range from \$3 to \$5 a belt. Surely car buyers won't balk at this, since in recent years they've got used to paying out hundreds of dollars for chrome and tailfins. Some safety features—the padded dash perhaps is an example—would be more expensive, but mass production methods should keep the cost within reason. It is well to remember that not many years ago turn signals were optional equipment. Who would think of buying a car now without such equipment?—even at lower cost.

Mr. Chairman, my bill H.R. 903 would direct the Secretary of Commerce to prescribe safety standards and devices for motor vehicles sold, shipped, or used in interstate commerce. He would be instructed to assure the public of the safest possible automobiles without unreasonably increasing automobile costs. Manufacturers would have 1 to 3 years to comply with the new regulations, giving them plenty of time to adjust their production methods.

I recommend H.R. 903 as a modest and workable proposal to give users of our streets and highways greater protection against fatal or crippling accidents. Thank you.

Mr. ROBERTS. Thanks, Mr. Bennett. I appreciate your appearance here before us and your extreme interest in this matter, since I know that you have been interested in this longer than the Chair, or as long. At least, you introduced a bill prior to this. I think that the only difference in our viewpoint is that in your original bill you mentioned certain devices which should be incorporated as a minimum of such devices that should be on the cars, whereas my approach was to leave it to the Secretary of Commerce and the Bureau of Standards. I think that we are, substantially, however, in agreement. The only difference is as to the method of operation.

Mr. BENNETT. As a matter of fact, your approach may be a much more practical approach, particularly to make a more limited approach. We could start in that field, and if it worked we could go ahead.

I wanted to continue my original bill, because it was the bill that I originally introduced. The original bill and the current bill do not set up standards. It gives authority to set standards and only points out fields in which things can be done. It does not conclude itself that anything per se is safe or unsafe.

Mr. ROBERTS. It corroborates. At any rate, I think that you are to be certainly commended. I hope that it could apply across the board. Certainly, there is no objection on my part to that.

It was my feeling from having talked to people in this field that we should start on Government purchased cars, and that we could hope that the industry would voluntarily do that for the public as soon as they had some demand for it or as soon as we could prove by having an accurate body of statistics that it was something to be provided.

You may be entirely correct in your approach. And I will be glad to cooperate with you.

Mr. BENNETT. Neither approach is contrary to the other. I will be very glad to cooperate with your kind of approach. You had it passed in the House and almost passed in the Senate. And the prospect is fairly good that it will pass. I am in no way testifying against your approach. I think that you have an excellent approach.

Mr. ROBERTS. I appreciate that.

Mr. SCHENCK. I would like to commend our very fine colleague from Florida for the very fine job he has done and his devoted interest as expressed in these features in automobiles. I would like to commend him for his bill.

Mr. BENNETT. Thank you, sir.

Mr. SCHENCK. The very first item I believe in your bill is a governor on the cars to govern the speed, at a predetermined top speed 80 miles or so or some other speed. I know that my colleague has specifically listed a number of other safety features which you would like to see incorporated in an automobile. But this is not obligatory?

Mr. BENNETT. The language of the bill merely says with regard to this speed of 80 miles per hour that no regulation could be put on a governor for a speed limit lower than 80 miles an hour.

Mr. SCHENCK. Well, I just wanted to point out that governors in the past have been regarded as being not too good, because in the matter of passing a car, the least time that you spend in passing, in the passing lane, the safer you are. If there is a limitation by means of a governor, when you are passing, and you have to speed up, you are in a very vulnerable position.

The chairman and I were almost in that same situation in a test on one of the proving grounds in Detroit. I thought we had it, because governors are quite dangerous. They have a limitation.

Mr. BENNETT. May I make two observations about this?

Obviously, a governor on some cars, when many other cars do not have a governor, would be extremely dangerous to have.

Obviously, if all cars were required to creep along the streets at 10 miles an hour, or 15 miles an hour, accidents could be greatly reduced.

The bill which I have introduced does not intend to say all governors are good. It merely intends to say that the Secretary of Commerce could decide that a governor would be good and to be required on all cars, not just on some cars.

Mr. SCHENCK. I want to thank our colleague and to commend him again for the fine job he has done.

Mr. BENNETT. Thank you all very much.

Mr. ROGERS of Florida. It is a pleasure and has always been a pleasure to have my good friend and colleague to express his views to this subcommittee, and to have the benefit of his leadership in this field. It is evident here by the ideas he puts forth.

It is a real pleasure to welcome him here and to support his views that we do need a great deal of work in this field. Let me say this off the record.

(Discussion off the record.)

Mr. THOMSON. I have no questions.

Mr. BENNETT. Thank you very much.

Mr. ROBERTS. I believe that we have one other witness today, Mr. John A. McCart, director of legislation of the American Federation of Government Employees, Washington, D.C. We are very glad to have you here before us and to present your views.

STATEMENT OF JOHN A. McCART, DIRECTOR OF LEGISLATION,
AMERICAN FEDERATION OF GOVERNMENT EMPLOYEES

Mr. McCART. Mr. Chairman and members of the committee, we have watched with considerable interest the progress of this legislation in the 86th Congress. And when it was reintroduced and hearings were scheduled we thought that it would be well to present the Federal employees point of view.

This bill, H.R. 1341, sponsored by Representative Roberts, has a worthy objective—

to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

Human considerations are involved in its provisions and this fact emphasizes its compelling advantages.

The bill is designed primarily to protect human lives—the lives of Federal employees who use Government-owned vehicles. For this reason, the proposal to increase the likelihood that motor vehicles used by the Federal Government will be safer vehicles has the indorsement of the American Federation of Government Employees.

It has been noted that the House Committee on Interstate and Foreign Commerce is genuinely interested in the importance of safety in interstate commerce. This interest makes this committee a potent force in the promotion of highway safety, and it has been evidenced by the continuing activity of the Subcommittee on Health and Safety. The bill under consideration is greatly in line with and would implement the subcommittee's desire to promote the safer use of motor vehicles by all persons. This would certainly be accomplished by this bill for the use of vehicles owned by the Government.

The need for this legislation or any measure which will promote the safety of the persons who use motor vehicles is evident. Accidents involving motor vehicles cause a tremendous loss of life and destruction of property. In 1959 there were 37,800 deaths resulting from traffic accidents throughout the country. The death rate was slightly over 21 per 100,000 population and more than 5 for every 10,000 motor vehicles on the highways. This latter rate denotes a high number of traffic deaths because of the great number of vehicles in use—more than 71 million in 1959.

For example, Dr. Chapman testified to the effect that there are some 38,000 deaths resulting from traffic accidents in 1959. The point that is of particular interest is the Federal employees' share in this loss of life and property.

Federal employees share in this loss of life and property. Of the 100,228 cases of accidental injury reported to the Bureau of Employees' Compensation in 1959, nearly 4 percent were caused by vehicles. Thus the Federal Government has a responsibility to protect its employees in the use of the motor vehicles it provides. At the present the Federal Government maintains a sizable fleet consisting of approximately 38,000 sedans and 8,000 station wagons. The replacement rate also involves a large number of vehicles, since it is presently maintained at a rate of about 10,000 a year.

There would seem to be little need for debating the desirability of augmenting the safety features of every motor vehicle whether it is publicly or privately owned or used. It has been contended that

this bill is unnecessary, in that the agency which purchases and supervises the use of automobiles for personal transportation already has the authority to prescribe safety devices by the enactment of legislation such as H.R. 1341. By so doing there would be placed in the law a positive requirement by Congress, as the legislative policymaking branch of the Government, of a method of determining minimum safety standards for passenger-carrying motor vehicles acquired for use by the Federal Government.

The importance of safety equipment cannot be overestimated. It is one of the effective means of reducing fatalities and of protecting human life and property. Of the factors involved in the effort to advance safety on the streets and highways, the equipment of motor vehicles with every desirable safety feature offers a large measure of effectiveness. Programs for the education of automobile drivers in greater awareness of danger and of the need for exercising greater caution are limited in their potentialities. The construction of safer highways has progressed over the years, but this factor in highway safety is likewise restricted because of the very great cost involved. Thus it appears that the attainment of the overall objective can in a large measure be achieved by making certain that the vehicles placed on our streets and highways are as safe as they can be made and embody all those features of design and equipment that would protect the persons who use them.

There has been over the years notable improvement in equipping automobiles so that there is lesser likelihood of accidents leading to injury or loss of life. This improvement has involved tires, brakes, windows and windshields, and lighting. There is however, a need for added safety features so as to eliminate the likelihood of those accidents which are caused by failure in the vehicle itself.

It has been noted that a Special Committee on Highway Traffic Safety of the House Committee on Interstate and Foreign Commerce several years ago urged the equipping of all automobiles with such items as crash-padded paneling, dishtype steering wheel, and safety glass. These items have meanwhile been adopted to a varying degree by the manufacturers. This recommendation of the group evidences the influence of a committee in Congress in bringing about needed improvement. That study of highway traffic safety has been continued by this subcommittee, and it resulted in the approval by the House in the last Congress of a bill identical with the one under consideration.

There are several items of safety equipment which might be added to Government-owned automobiles and they would not greatly increase the cost of the vehicle. It has been contended that the equipment of Government cars with additional devices would result in considerable cost. Where human life is involved there is no alternative but to employ every measure of safety at any cost within reason. The fact is that supplementing the currently standard equipment could be accomplished at moderate cost. Where seat belts cost about \$70 several years ago, they can now be provided for less.

Four items of equipment are suggested as ones that would greatly enhance the safety of Federal employees using Government-owned vehicles. These items of equipment are safety door locks, crash-padded paneling, anchoring seats more securely to the floor of the

vehicle, and safety belts. Some cars already on the market include door locks which do not permit car doors to open upon impact. There also has been some attention to crash-padding and to the firmer placement of seats within the vehicle. Seat belts have so far gained limited popularity, but it is understood that cars may come on the market in the near future so equipped as to permit the satisfactory installation of seat belts as additional equipment.

I think the essential point is that the influence of the committees of Congress is in bringing about improvements in this important field of safety. All legislation previously has been as to the types of devices or equipment that could be considered, including safety belts. And we note here that while safety belts cost about several dollars, that is, they did several years, they can now be provided for much less cost, so that there is a diminishing cost factor for these devices as they become more popular with the general driving population.

A pamphlet recently published by the National Safety Council in cooperation with the U.S. Department of Health, Education, and Welfare, and the American Medical Association, states some interesting facts about the use of seat belts as a means of saving human life when a traffic accident occurs. In that pamphlet a statement is made that—

the automotive seat belt is the most effective single item of protective equipment presently available to reduce the toll of traffic injury and death.

It is pointed out that thousands of lives are lost each year because persons are thrown against the windshield or out of car doors by the impact of the crash. It is stated the chances of an individual being killed in an accident are five times greater if he is thrown from the vehicle. The likelihood of death would obviously be reduced by a device which would keep the person inside of the car.

It is also noted in this pamphlet that contrary to popular notion seat belts offer greater protection at moderate speeds, because more than half the accidents causing injury or death involve speeds of less than 40 miles per hour. There is also a mistaken belief that seat belts are not needed by persons who drive mostly in their communities rather than on long trips. However, three out of four traffic deaths occur within 25 miles of home, according to the statement sponsored by these three organizations.

There is no need to explain the reason for safety belts. The point I want to make is that you will note that the Department of Health, Education, and Welfare is a party to the pamphlet recommending the use of safety belts. It would, certainly seem appropriate therefore, that the Federal Government promote the use of this particular safety device by using it itself and setting a very good example for the driving public.

The use by the Federal Government of passenger-type vehicles has already been indicated as sizable, since it purchases about 10,000 a year. Because the number is larger, it can well mean that the Federal Government can exert leadership in the field of vehicular safety when purchasing automobiles for its own use. If the Federal Government were, for example, to require seat belts, it would undoubtedly contribute significantly to their popularity. The very fact that the Government insisted on safety features would certainly have its effect

on design and manufacture. At present, Government cars are accepted with the safety features placed on them by the manufacturers. Is this sufficient? We believe there is room for improvement.

This bill has many implications. Its benefits will be varied, and the AFGE is of the belief that it should be approved and enacted without delay.

Mr. ROBERTS. We thank you very much for your statement, Mr. McCart.

It has been called to my attention that there are some of the agencies and bureaus in the Federal Government who at the present time are using safety belts in their passenger type vehicles, such as the Federal Bureau of Investigation and perhaps, one or two others. Are you familiar with that?

Mr. McCART. No, sir. I am not familiar with the agencies which use them on an optional basis now, but it does seem to us that this should not be a question of discretion or option on the part of the agencies—it should be a matter of a requirement, if it is a safety practice. These agencies should be required to adopt the equipment that will provide safe conditions for the employees to work under.

Mr. ROBERTS. I was impressed with your statement as to the number of Federal employees who are affected by this—100,000 cases of accidents. It was 84 percent caused by that?

Mr. McCART. Yes.

Mr. ROBERTS. I have asked the Bureau of Employees Compensation for statistics on the cost of accidents to Federal employees, and at this time I will include the Bureau's report in this record, that is, if there is no objection.

(The report follows:)

DEPARTMENT OF LABOR,
BUREAU OF EMPLOYEES' COMPENSATION,
Washington, D.C., June 9, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety,
House of Representatives, Washington, D.C.

DEAR CONGRESSMAN ROBERTS: I am forwarding herewith a statement compiled from reports of injuries filed with the Bureau under the Federal Employees' Compensation Act showing the number of disabling nonfatal injuries and the number of fatal injuries attributed to vehicular accidents during the 5-year period 1955-59, inclusive. The statement also shows the total number of days chargeable on account of such injuries and the estimated total cost of benefits payable under the Compensation Act for disability and death.

Attention is invited to the footnote explaining the tabulation of injuries under this classification. The classification includes all injuries caused by land vehicles in motion. It does not include injuries connected with the operation of railroads, aircraft, or watercraft.

The days lost chargeable to such injuries include a standard time charge of 6,000 days for fatal and permanent total disability cases.

The estimated total direct cost of such injuries includes direct expenditures estimated to be paid for compensation benefits and the value of days' leaves of absence with pay during the period of disability.

I trust this information will be of interest to you, and with best wishes, I am
Very truly yours,

WM. McCAULEY, Director.

Number and liability of vehicular injuries reported to the Bureau of Employees' Compensation for calendar years 1955-59

Year	Total number of vehicular injuries	Nonfatal disabling	Fatals chargeable	Days chargeable	Total direct cost
1959.....	3,912	2,177	50	421,010	\$4,335,307
1958.....	3,265	1,855	36	363,581	3,025,631
1957.....	3,315	1,924	48	461,718	3,214,176
1956.....	3,068	1,854	51	449,221	3,668,991
1955.....	3,015	1,828	44	455,512	4,166,050
Total, 5 years.....	16,605	9,638	229	2,091,042	18,410,155

Year	Total direct cost of all causes of injuries	Total number of lost time injuries, all causes	Percent of lost time vehicular injuries to all lost time injuries	Percent of cost of vehicular injuries to cost of all injuries
1959.....	\$29,908,185	42,777	5.2	14.5
1958.....	28,008,168	40,216	4.7	10.8
1957.....	27,529,868	41,584	4.7	11.7
1956.....	29,203,216	40,475	4.7	12.6
1955.....	20,304,396	38,840	4.8	15.8
Total 5 years.....	140,953,833	203,892	4.8	13.1

NOTE.—The above includes all vehicular injuries to Federal civilian employees for the years indicated while the vehicle was in motion. It includes drivers, passengers, pedestrians, and others working on or around vehicles.

Mr. THOMSON. If you will yield on that point, I wonder if that 4 percent represented vehicles that were federally owned or 4 percent represents privately owned vehicles, as well as Government vehicles?

Mr. McCART. Well, Mr. Thomson, it would not necessarily have occurred in a federally owned vehicle. The employee could have still been injured while performing his official duty in his own vehicle which, for these purposes, is considered as official, because he is performing his job in a vehicle. You see, not all Federal employees use federally owned Government vehicles in performing their duty. Some use their own vehicles and are reimbursed at a mileage rate. So that it could conceivably happen in a personal vehicle while the employee was engaged in his official pursuit. But I think the important point to us is that it numbers some 4,000 employees who had accidental injuries on the highways.

Mr. THOMSON. Thank you. That is all.

Mr. ROBERTS. I also thought your statement with reference to the fleet of automobiles showed that this would be an operation where we have about 38,000, and we have a replacement rate of approximately 10,000 a year.

Mr. McCART. Yes, sir.

Mr. ROBERTS. I assume that you will agree that if we have an operation that would give us accurate statistics on what might be expected, that we could have some valuable and helpful information, in that we could through executive direction keep an accurate check on these particular vehicles that are in current use where safety devices have been installed as to the deaths and accidents as such.

Mr. McCART. I think that the safety departments of the various Federal agencies could well maintain figures on the accident rate, as

to the number of serious injuries that are prevented by the use of these various safety devices. And I think, too, that the legislation you have introduced, Mr. Chairman, would permit the use of various types of safety equipment in addition to what has been mentioned. We have been talking, primarily, about four types of devices, but there may come in the future proven equipment that will aid in reducing accidents. This bill would permit the use of those with proper discretion and control.

Mr. ROBERTS. Do you anticipate that the addition of safety devices would reasonably increase the cost of passenger type equipment so far as the Federal Government is concerned?

Mr. McCART. I have no idea of the amount of money that would have to be invested to install the equipment that has been discussed here today and what we cannot foresee in the future. I can only make the general comment that any reasonable cost would be an excellent investment if we are able to save the human lives and suffering and to reduce the cost of compensation benefits to employees and to their families, because there will be a saving in that direction.

Mr. ROBERTS. That is true, there should be. That is, if medical opinion in that field is correct. The reduction in cost of compensation would level out the cost of these additional devices.

Mr. McCART. It could very well be, Mr. Chairman.

Mr. ROGERS of Florida. I appreciate very much this testimony. I think you have pointed up a situation that exists and that we, certainly, should have leadership of the Federal Government in its own operations to provide these devices.

Mr. ROBERTS. This completes the list of witnesses for this morning. I have several statements that I would like, without objection, to include in the record.

The first is a statement from Dr. Horace E. Campbell of Denver, who appeared in the 1959 hearings on behalf of the American Medical Association and the American College of Surgeons. This statement is dated March 15, 1961. It approves of the legislation. And without objection that will be included in the record.

(The statement dated March 15, 1961, follows:)

DENVER, COLO., March 15, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, House of Representatives, Washington, D.C.

DEAR MR. ROBERTS: It has come to my attention that hearings are again to be held on H.R. 1341.

First, let me state that the failure of the Surface Transportation Subcommittee of the Senate even to consider H.R. 1341 when it was referred to the members constitutes one of the most tragic events in American history. Had the bill been considered and passed by the Senate, it would have led to the saving of thousands of lives in the next few years, for the bill is the first practical step in getting the American automobile to conform to well-known and recognized principles of safe design and construction.

It is coming to be recognized through the efforts of the Cornell Crash Injury Research group that specific design factors in the automobile lead to specific injuries in the event of a crash, injuries that all too often are severely disabling and in some cases fatal.

Dr. Claire Straith of Detroit, a plastic surgeon, as early as 1934 had numerous conferences with the automobile makers, begging them to design and construct the car interior so as to inflict as little injury as possible upon the occupants should crash occur. Many engineers in the industry recognized the truth of Dr. Straith's suggestions, but the sales-psychology personnel vetoed the suggestions, and management chose to follow the recommendations of the sales-psychologists.

In 1948, Dr. Fletcher D. Woodward, as chairman of the section on laryngology, otology and rhinology of the American Medical Association, and after an extensive experience in the care of facial injuries following car crashes, pointed out the specific injury-producing features of the car interior and made detailed suggestions for their correction. These were ignored, and even ridiculed, by the motor-car industry (the *Journal of the American Medical Association*, vol. 138, No. 9, October 30, 1948, pp. 627-631).

Then in 1955, Dr. C. Hunter Shelden, a brain surgeon, pointed out again the specific design features of the automobile which produce 70 percent of the fatal injuries, i.e., those to the brain, and made suggestions for their correction (the *Journal of the American Medical Association*, vol. 159, No. 10, November 3, 1955, pp. 981-986).

In 1956, for the first time, certain crash-safety design features appeared in the American automobile. These were minor, the essential ones were on an optional basis, i.e., were not standard equipment, and were stated by the industry to be but a first step.

There has been no significant improvement in the standard features in the cars appearing since 1956, that is, in the steering wheel, the door locks, the seat attachments. The design of the instrument panel in several cars has deteriorated, flouting in a most cynical manner, the principles laid down by Drs. Straith, Woodward, and Shelden. Furthermore, those cars with the widest distribution have had front seats every year since 1956 and including the 1961 models which have made it increasingly difficult and expensive to install seat belts. And further still, the instrument panel padding, offered on an optional and rather expensive basis, has in some cases become so scanty as to area and depth, as to be virtually worthless.

For these, and many other reasons that could be cited if space permitted, it is time that the Federal Government provide for us the protection we so seriously need in the field of motorcar transportation, that it provides in the realm of pure food and drugs, meat inspection, mine safety, marine navigation, and in aviation.

The very least that can be done is to provide this protection in the cars used by Federal employees.

Thousands of individual doctors and almost all, if not actually all, of the important elements of organized medicine have gone on record as favoring H.R. 1341. Its passage will be a most significant first step in preventing many thousands of deaths and injuries.

Yours very sincerely,

HORACE E. CAMPBELL, M.D.,

Chairman, Automotive Safety Subcommittee, Colorado State Medical Society; Formerly Vice Chairman, Committee on Medical Aspects of Automobile Injuries and Deaths, American Medical Association.

Mr. ROBERTS. Also, I have an article which appeared in *Automotive News* dated March 27, 1961, which has to do with the glass parts of the vehicles and is with reference to AMA's position on glass safety. This is an article, charging that the automotive industry has recently switched to the use of tempered glass in side windows, obviously to save a reported \$8 to \$12 per car. It is my understanding that there will be a witness at tomorrow's hearing to outline the position of the glass industry with reference to the use of laminated glass as against tempered glass. And without objection that article will be made a part of the record at this point:

(The article follows:)

[From *Automotive News*, Mar. 27, 1961]

SHATTERPROOF HITS AMA'S POSITION ON GLASS SAFETY

DETROIT.—The battle of words over the relative safety merits of laminated and tempered glass continues to rage.

Shatterproof Glass Corp., Detroit, manufacturer of both types, last week insisted that laminated, which has been in use for 25 years, still is the safest kind of automotive glass.

The statement was made in rebuttal to a report by the Automobile Manufacturers Association contending that there is no choice as far as safety is concerned between laminated and tempered.

The AMA report was in reply to earlier charges that tempered glass was less safe, and that automakers should be required to use laminated for all glass areas.

"The automotive industry has recently switched to the use of tempered glass in side windows, obviously to save a reported \$8 to \$12 per car, at the cost of safety to driver and passengers," said a spokesman for Shatterproof, a big supplier of replacement glass.

He argued that tempered glass becomes weaker and less safe with age, and said that the manufacturing process for tempered cannot be perfectly controlled.

"Imperfect tempered glass will break into sharp, cutting pieces, not the harmless particles claimed by the AMA, and not until it is broken can it be tested," he added.

Mr. ROBERTS. One of the leaders in the fight to get safer motor vehicles has been Dr. C. Hunter Shelden, Pasadena, Calif., one of the Nation's leading brain surgeons, who has made great contributions in calling attention to specific design features of the automobile which produced fatal injuries. Dr. Shelden is unable to be with us today, but I have a very interesting and persuasive letter from him which I will ask to have included in the record at this point, without objection.

(The letter dated March 17, 1961, follows:)

PASADENA, CALIF., March 17, 1961.

Re H.R. 1341, motor vehicle safety.

HON. KENNETH A. ROBERTS,

Chairman, Subcommittee on Health and Safety, House of Representatives, Washington, D.C.

DEAR MR. ROBERTS: I should like to take this opportunity to express my opinion in favor of your bill, H.R. 1341, to establish safety standards for Government-owned passenger-carrying motor vehicles.

The problem of proper regulation of more adequate and standardized requirements for highway safety is one of the more urgent problems affecting this country. Obviously, highway construction and driving regulations are important but, from the medical standpoint, it is urgent that prompt and adequate measures be taken to protect the individual or individuals in the vehicle at the time of the accident.

This problem was investigated thoroughly in 1959, and I need not repeat the many details that were brought out at those hearings. During the interval, accidents have continued, and thousands of needless deaths have occurred as a result of engineering and lack of standards in motor vehicles. These problems need prompt attention and must be rectified in order to curtail the present high mortality and morbidity. As I have frequently stated, the only adequate treatment for head injuries is their prevention.

I can see no reason why all necessary changes cannot be made without them, in any way, interfering with the automobile industry; in fact, the industry at large would profit and expand as a result of proper regulations in much the same way that the airlines have profited by the safety standards imposed upon them by the Federal Bureau of Aviation.

The entire economy of the country would benefit since, at the present rate, the automobile industry is losing by accidental deaths well over one-half million potential customers each decade.

Sincerely yours,

C. HUNTER SHELDEN, M.D.

Mr. ROBERTS. I, likewise, have a letter from Dr. Fletcher D. Woodward, of Charlottesville, Va., who is nationally known for his work in the field of highway safety and accident prevention. He favors enactment of H.R. 1341. The letter makes many constructive suggestions to promote highway safety, and without objection this letter will be included in the record at this point.

(The letter dated March 15, 1961, follows:)

CHARLOTTESVILLE, VA., March 15, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety,
House Office Building, Washington, D.C.

DEAR MR. ROBERTS: I thank you for your note of March 13.

I would like to urge again in order to protect people from injury and death in the operation of a motor vehicle that—

(1) We should have laws to control the drinking and speeding driver adequately. We must have proper driver training courses in all schools with behind-the-wheel instruction. We must revise the requirements for issuing licenses to drivers and they should be subject to reexamination from time to time. There are many things that both the doctors and the various State legislatures and our Congress can do along this line which would be of great help.

(2) In those instances in which crashes are unavoidable the machine should be so designed that the occupants would be protected in such an event. Among these protective measures are seat belts, and certainly all cars owned by the Federal Government should have them installed. And, of course, the drivers themselves have to be educated as to their use. There are many other features of automotive design which should be changed in consultation with the medical profession.

All of these items are discussed in more detail in the enclosed reprints.

I certainly hope that your bill will receive favorable consideration this session. If I can be of any further help in this worthy undertaking please call on me.

Yours very sincerely,

FLETCHER D. WOODWARD, M.D.

Mr. ROBERTS. That will conclude the hearings for today, and the hearings will resume tomorrow morning in the Banking and Currency Committee at 10 a.m.

(Whereupon, at 11:45 a.m., the committee adjourned, to reconvene tomorrow, Tuesday, March 28, 1961, at 10 a.m.)

MOTOR VEHICLE SAFETY STANDARDS

TUESDAY, MARCH 28, 1961

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY
OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1301, New House Office Building, Hon. Kenneth A. Roberts (chairman of the subcommittee) presiding.

Present: Representatives Roberts, Rhodes of Pennsylvania, Rogers of Florida, O'Brien, Schenck, and Thomson.

Mr. ROBERTS. The subcommittee will please be in order.

We have a good many witnesses today and I am going to ask the cooperation of the witnesses in trying to keep their testimony as brief and to the point as possible so that we can get through. A very important piece of legislation is on in the House so that this committee may not be able to sit this afternoon.

I have for the record a statement of the American Medical Association, which I will place in the record.

(The statement follows:)

AMERICAN MEDICAL ASSOCIATION,
Chicago, Ill., March 28, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR CONGRESSMAN ROBERTS: This will acknowledge with thanks your letter of March 13, 1961, in which you inform us that hearings have been scheduled on H.R. 1341, 87th Congress, a bill to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards. We welcome the opportunity to reaffirm our active support of this proposed legislation.

We believe that improvement in the design and safety equipment of automobiles will lead to a rapid reduction in fatalities and severe injuries suffered in automobile accidents. Available research data clearly indicate the value of certain safety features of automobile design, construction, and equipment. Many of these safety features are currently available only as optional equipment at extra cost.

Among the recommended standard safety features are the following:

(1) Anchorage points for seat belts. In this regard, the manufacturers of motor vehicles should be commended for their recent announcement that attachments for seat belts in the front seat will be standard equipment on all 1962 vehicles.

(2) Crash padding of the dashboard, roof and other impact areas.

(3) Improved steering wheel and recessed post; perhaps a collapsible assembly.

(4) Safety door locks on all motor vehicles.

(5) Elimination of protruding knobs, buttons, handles, and sharp edges.

(6) Improved anchorage of the seats in motor vehicles. Seats should be high enough to protect the neck and to prevent neck snap injury or whiplash, a frequent result of rear-end collisions.

(7) Improved storage space behind the rear seat. Passengers should be protected from the possibility of injury by flying missiles by the provision of an effective retaining rail or recessed storage space.

(8) Improved systems of intercommunication between drivers of moving vehicles.

These suggestions were among those presented to you in my letter of July 6, 1959. I also submitted these suggestions to the Honorable George A. Smathers, chairman of the Senate Subcommittee on Surface Transportation on June 23, 1960.

The American Medical Association believes that enactment of H.R. 1341 and the establishment of sound safety standards by the Secretary of Commerce will serve as a strong inducement to the automobile industry to include in all motor vehicles safety devices which will inure to the benefit of all the American people.

I appreciate this opportunity to present the views of the American Medical Association on this most important subject and request that this letter be made a part of the record of your hearings.

Sincerely yours,

F. J. L. BLASINGAME, M.D.,
Executive Vice President.

Mr. ROBERTS. And our first witness this morning will be Mr. Charles Prisk, Bureau of Public Roads, Department of Commerce, accompanied by Paul Johnston, Executive Assistant.

If you will come around to the witness chair, we will be glad to hear you.

**STATEMENT OF CHARLES PRISK, SPECIAL ASSISTANT, BUREAU OF
PUBLIC ROADS, DEPARTMENT OF COMMERCE, ACCOMPANIED BY
PAUL JOHNSTON, EXECUTIVE ASSISTANT**

Mr. PRISK. Mr. Chairman and gentlemen, my name is Charles Prisk, Special Assistant in the office of the Bureau of Public Roads.

It is a pleasure to present the report of the Department of Commerce on H.R. 1341:

This is in reply to your request of February 9, 1961, for the views of this Department with respect to H.R. 1341, a bill to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

The bill would require the Secretary of Commerce to prescribe safety standards for vehicles purchased or leased by the Federal Government. The General Services Administration, with few exceptions, presently purchases all passenger-carrying vehicles for the use of the Government. That agency already includes in its procurement specifications various safety requirements; and, of course, would have the legal authority to prescribe any of the safety devices referred to in the subject bill. Because of this present administrative practice, we are not certain that enactment of H.R. 1341 is necessary to achieve the results contemplated under the bill. We would add that the Department of Commerce does, of course, have an interest in this subject and if Congress finds that it would be helpful for the Department to prescribe minimum safety standards, we would carry out that responsibility.

For your information there is enclosed a copy of our "Safety Program Guide," which adopts as Department policy a rule to install and use seat belts in all official vehicles operated by the Department.

We would also call to your attention the highway safety report sent to Congress in accordance with section 117 of the Federal-Aid High-

way Act of 1956, House Document 93, 86th Congress, 1st session, which concluded that the advancement of safety in vehicle design and equipment was a responsibility not of any one level of the Government but of industry as well. Furthermore, it has been found that as to some aspects of vehicle design relating to highway safety, there is at present no accepted or practical basis for standardization. The Interdepartmental Highway Safety Board, recently established by executive order, could promote intensified work on safety standards for devices on passenger vehicles acquired by the Government.

The Bureau of the Budget advised there would be no objection to the submission of this report from the standpoint of the Administration's program.

I am accompanied this morning by Mr. Paul Johnston, Executive Assistant to the Secretary of Commerce.

He may have some supplemental remarks to make.

Mr. ROBERTS. We will be glad to hear from you.

Mr. JOHNSTON. I have nothing to say other than I should like to emphasize that the Department is not taking a negative attitude on highway safety, but we would like to cooperate with the committee, and anyone else in the promotion of this activity.

The Secretary of Commerce, as Governor of North Carolina, before he came to Washington, had a rather distinguished record in this field, and, consequently, his deep interest in the subject is a matter of record.

On this particular legislation, as you will note from Mr. Prisk's reading of the position of the Department, the Department takes a rather neutral attitude, but GSA, being the agency in charge of Government-owned vehicles, and for the procurement of same, has the authority to prescribe certain safety requirements. It would seem to me that this agency, if reminded by this committee of what the committee's wishes are, would, probably, follow the committee's wishes; and if not, and to the extent that the committee thought further action should be necessary, then I think a bill would be in order.

That is all I have to say on this particular bill, Mr. Chairman.

Mr. ROBERTS. Thank you, Mr. Johnston. We are glad to have your appearance.

Mr. Prisk, you presented us with a survey or study that was made, I believe, under section 117 of the Highway Act of 1956.

Mr. PRISK. Yes, sir.

Mr. ROBERTS. I am quoting: from that study, which I believe was called the Federal Role in Highway Safety, submitted to Congress in 1959, and on page 3 of the report, I find the following comment regarding the manufacture of safe vehicles:

There are residues of weakness in automotive design and function, however, to which manufacturers and public officials alike need to give further attention. Comparatively simple improvements with advantage to safety could be adopted in defrosting and defogging equipment, arrangement of vehicle lighting for more positive identification of the presence and actions of other vehicles and drivers, and the positioning of instruments and foot controls to serve more nearly the functional demands of safe driving. More fundamental alterations of vehicle design and control features are being developed, but will require extended and thorough testing before general introduction. These and other vehicle design characteristics are treated extensively in the full report.

Minimum standards for some motor vehicle safety features have been established by cooperative efforts chiefly of automotive engineering groups and Government at appropriate levels.

Many States require certification through their motor vehicle departments that these standards have been met. An expansion of such standards and a more widespread use of the certification process by the States, would lead to quicker adoption of desirable vehicle safety features.

It seems to me that here is an implication that if certain desirable safety features are not being built in the car offered to the public, that steps should be taken to require manufacturers to adopt these safety features.

Do you agree with that statement?

Mr. PRISK. Yes, I would.

Mr. ROBERTS. Do you agree then that a State has the responsibility to require the adoption of safety features to protect its citizens?

Mr. PRISK. On motor vehicle equipment?

Mr. ROBERTS. Yes.

Mr. PRISK. Yes.

Mr. ROBERTS. Then why does not the Federal Government have the responsibility to require the minimum safety features be incorporated in passenger-carrying motor vehicles the Government buys for the use of its employees? Why does it not have that responsibility?

Mr. PRISK. I think the answer is quite apparent, and that we must agree that in philosophy there is responsibility at the Federal level for its vehicles, just as there is on behalf of the public at large.

We have taken the position in our statement today, I think, that indicates only that if your committee decides this existing legislation which would introduce these safety standards is not working adequately or is not sufficient that the Department of Commerce is ready to discharge its responsibility in this area.

Mr. ROBERTS. It would seem to me, Mr. Prisk—I do not know whether you agree with it or not—but it would seem to me that the Commerce report actually goes a bit afield from the committee bill, that is, the Roberts bill, in that I have never contended that the Roberts bill called for any change in design of the vehicle.

Actually, it would seem to me that there is an implication in this report, where you speak of certain design features, for instance, the position of foot controls, and so forth, and then the report says: "More fundamental alterations of vehicle design and control features are being developed." It does not actually say that should be done, but there seems to be an implication in the report of design being considered. And as I say, my bill simply deals with reasonable safety standards. That is all I have.

Thank you, Mr. Prisk, and thank you, Mr. Johnston. There may be other questions by subcommittee members.

Mr. SCHENCK. I was delayed by a long-distance call. I did not hear the testimony. I have no questions at this time.

Mr. JOHNSTON. Is it the intent of the committee to discuss H.R. 903 this morning? Is that open?

Mr. ROBERTS. H.R. 903. That is, the Bennett bill, which is also before the committee. And if you have any comments about it, we would be glad to have them.

Mr. JOHNSTON. I wonder if I could make a few comments on this and the brake fluid legislation with which the committee was concerned on last Friday?

Mr. ROBERTS. Certainly.

Mr. JOHNSTON. The Department sent forward a suggestion—and I assure you that it was only a suggestion—that this matter of highway safety equipment regulation conceivably is one which involves serious problems of intergovernmental relations between the States and the Federal Government. And the suggestion was that the matter be referred to the intergovernmental relations commission for a comment. And I wanted to speak to that suggestion that we made and to assure the committee that no intent to take a negative position or to delay the action of the committee in this field was intended.

It grew out of a suggestion I made myself in the Department's considerations of the matter, because of my previous experience with legislation that was worked out at the Federal and State level and was a rather happy experience in intergovernmental relations; and I refer to the Motor Boat Act in which a committee of which I was chairman, consisting of State and Federal officials, aided the Bonner committee in drafting a Federal bill pursuant to which State legislation could be passed.

And it has had the most remarkable success of any experiment of that nature that I have ever heard of.

It seemed to me that this might be a field in which this technique could be used to an advantage. We hear so much complaint about Federal interference with State rights. Yet many of us know that sometimes that complaint is raised merely as a device to avoid doing anything.

In the motor boat field by bringing in State officials from the inception in the drafting of the legislation, and the planning that went into it, the ground had been plowed and more than 38 States in the first 18 months after the Federal legislation was adopted have adopted State legislation which complies with the Federal standards.

My thought in referring this to the intergovernmental relations committee was this: simply to ask of them whether they thought this was a problem of that nature, and would it be beneficial to both the Federal and State activities in this field to have it pursue a course somewhat similar to that. It does not seem to me that it would take long for them to give you an answer on that question, yes or no.

Then if they say, "Yes", the question is before the committee of whether to call on the Council of State Governments, which was the instrumentation of the views in the Motor Boat Act and to set up the machinery to do this.

If the committee feels that time does not permit this, that is a judgment decision that the committee has to make.

I just wanted to clarify the position of the Department in making that suggestion. And I appreciate this opportunity.

Mr. SCHENCK. May I make a comment there?

Mr. ROBERTS. Just one minute. I want to say that I appreciate very much your comment. I think that we have here a little different situation because I think the States already have the power, certainly, in purchasing their own equipment, to insist that certain minimum standards of safety be met. And I wanted to simply say that the Federal Government should have the same right to prescribe certain minimum standards be included in the cars purchased for its employees as the States do at the present time.

Mr. SCHENCK. Mr. Chairman, I am sure that Mr. Johnston will agree that in many instances referring these matters to what you referred to as a committee is often a fatal accident because that is the end of it.

Mr. JOHNSTON. I can agree with that; yes, sir.

Mr. SCHENCK. And I wanted to call your attention to the fact that these two bills which are before the Congress, one as the chairman has well pointed out suggests that the Federal Government should take the initiative and the lead and to furnish the leadership in requesting the use of safety devices on federally owned automobiles that are available; therefore, the Department of Commerce would have a responsibility to determine the effectiveness of those items.

In bill number H.R. 903, that goes to a little different situation, in that it applies to interstate commerce.

Mr. JOHNSTON. If I might interrupt 1 minute. My comments on this reference to intergovernmental relations are not applicable to the 1341 bill. I was not suggesting—I did not mean to suggest that that bill be referred to this committee.

Mr. SCHENCK. I am glad to have you say that because I am sure you wanted to clear that.

Mr. JOHNSTON. I am sorry that I gave you that impression. That bill, it seems to me, is solely within the province of the Federal Government. I have no question about that.

Mr. SCHENCK. The provisions of H.R. 903 and the provisions of the exhaust gas bill that I offered and which was enacted into law last year go to interstate questions. Those are questions in which this committee and other committees of the Congress are very much in accord, I think, in their thinking and planning and the ideas behind them, because, certainly, automobiles that are sold, being in interstate commerce, are subject to proper regulation.

The idea of compacts of States to work out safety matters of uniform traffic codes, would be very helpful, but that again depends upon this interdepartmental or intergovernmental, that you speak of.

Mr. JOHNSTON. If I may make a comment here. I agree with you 100 percent, but you do have the responsibility in the interstate field—and automobiles are in interstate commerce—I think if we were starting from the beginning before automobiles had developed the way they have, before conditions had developed as they have, you would go at it directly from the Federal level, but these conditions have been built up in which the States have traditionally exercised these safety responsibilities.

I am not saying that that is necessarily the best way to do it. I am just saying that is the way it has built up. And when you go to change that, it seems to me it might be palatable and you might get better cooperation all along the line if recognition were taken of that fact in the process of forming Federal legislation.

I would, also, add—and this is my personal view—that you do need a Federal law on the matter in order to encourage the States to do what is necessary to conform with it. For instance, the boating law says, if you do this, then it is your baby. If you don't do it, then we are going to do it. And that is an approach.

Mr. SCHENCK. I am glad to have your comment. On the exhaust gas situation, for example, because of the lack of Federal action on

this, the State of California did take action. If States throughout the Nation develop different kinds of regulations, then you will have a fine time of meeting all of these regulations, that is, the manufacturers will. The Department of Commerce is the place, it seems to me, which should be on top of this, in an effort to be of assistance, not only in the field of safety but to the manufacturers and to the dealers and to the service people throughout the Nation.

Mr. JOHNSTON. I get the impression that we are, certainly, not apart in our views on this thing. I think the Federal legislation would have to encourage and require some measure of uniformity or you will have a hodgepodge. And again, I refer to the Motor Boat Act which does require that.

Mr. SCHENCK. That is all.

Mr. ROBERTS. Mr. Rogers of Florida.

Mr. ROGERS of Florida. I am sorry I was not here to hear your statement, but I have read the report. Of course, I have been a little concerned since we have started in to hearings here because there seems to be a lack of planning on just what action should be taken. I think our Departments have not decided who does have the primary responsibility to move in this field and that is what concerns me.

And as the chairman has indicated, extensive hearings are going to be held in this field because I think it is fairly important. I know all of the members of this subcommittee, many who have been on it longer than I, and have worked on this problem, have been greatly concerned that so little has been done on research and leadership by the Federal Government in safety features.

In your report here, I notice that you indicate that probably the Interdepartmental Highway Safety Board would be a proper one to take this matter up with. Is that the feeling?

Mr. JOHNSTON. May I comment? As I understand it, that Board was authorized by Executive order in December. And as I understand it, it has not been organized. My remarks, again, I say that maybe—I do not have any strong feeling personally about that, an approach to this federally owned vehicle problem. I really am not trying to address myself to that problem so much.

I think our position now, Mr. Rogers, is that GSA has this authority and responsibility, that if they could exercise it to the satisfaction of this committee; they could.

Now, if they do not, then the committee will have to take its own action.

Mr. ROGERS of Florida. Here is what I want to know: Is it your feeling then that it should be GSA who determines the standards?

Mr. JOHNSTON. For federally owned vehicles, yes.

Mr. ROGERS of Florida. In other words, they should be the ones to do the research and to determine what particular safety features should be included?

Mr. JOHNSTON. I do not know that they are equipped for that.

Mr. ROGERS of Florida. Who should do that, in your opinion?

Mr. JOHNSTON. As we say here, the engineers, the societies, and so forth, and I don't say that the Federal Government does not have responsibility here. I don't know.

Mr. ROGERS of Florida. That is what I want to determine. I think it has been in our mind whether it is a proper function of the Department of Commerce and the Bureau of Standards.

Mr. JOHNSTON. I, certainly, would not say that is not so. I just have not thought that through.

Mr. ROGERS of Florida. That is what I am concerned with.

Mr. JOHNSTON. I see.

Mr. ROGERS of Florida. Because every Department we go to says, "Well, I don't say that it is not, but I am not saying that it is."

Maybe we should go to the Interdepartmental Highway Safety Board which was set up in December. I believe it is under HEW, but is not yet functioning. We do not know with whom we should deal on this problem. I think that we have not given enough attention to determining specifically the responsibility to get some research going, because this problem is growing. We had testimony yesterday that 40 percent of the deaths, 90,000 deaths, are from highway accidents, automobile accidents. That is a tremendous sacrifice for this Nation to make. So much of it could be prevented, at least according to experts, if we had research and leadership in this safety field.

It seems to me we are being very, very negligent in not heading up this research phase on the whole problem.

Mr. JOHNSTON. I have no disagreement with what you say at all. I think we say in this statement now, I think, it is up to this committee and Congress to say who shall have this responsibility rather than the departments themselves. I think that is a congressional function, that they say "This department will do this," and "that department will do that."

Mr. ROGERS of Florida. We have it set up in the Commerce, but, evidently, we don't have it there.

Mr. JOHNSTON. There is no program that I know of. There may be—I am fairly new—but I do not know of any program along these lines that is going on specifically designed for this purpose in the Department of Commerce.

Mr. PRISK. That would be aside from the Interdepartmental Highway Safety Board proposal. It is relatively new, of course, and with the changing administration, I think there is, perhaps, some reason to understand why it is not operative and producing as of this date.

Actually, having worked on the production of this recommendation for the Interdepartmental Board in the study authorized by section 117, I think I can say that in the background of our reasoning was the fact that there were many Federal agencies like GSA which is a member of the Board, the Department of Commerce, which would include the facilities of the Bureau of Standards and as well as our interests in the Bureau of Public Roads, and HEW, who are intimately concerned with many of these highway safety efforts. There is no link presently of a formal nature among the group. We do need all of these disciplines to bear on the planning of the proper comprehensive program for highway safety, both in terms of highway, the vehicle, and what may be done with respect to the driver, which is the most important.

Mr. ROGERS of Florida. Who would be the members of the Interdepartmental Highway Safety Board?

Mr. PRISK. The members of the Interdepartmental Board are set up in the Executive order to include the Secretary of Commerce, as its Chairman, the Secretary of Health, Education, and Welfare, the Secretary of Defense, the Chairman of the Interstate Commerce Com-

mission, the Postmaster General, and the Administrator of the General Services Administration.

I believe that is it.

Mr. ROGERS of Florida. What staff do they have under the Executive order?

Mr. PRISK. The staff provided under the Executive order is the staff provided as necessary to accomplish the purposes of the order from the member representatives.

Mr. ROGERS of Florida. I presume that would be set up by the Chairman?

Mr. PRISK. Presumably so, yes.

Mr. ROGERS of Florida. What is the thinking as to the size of the staff which would be necessary?

Mr. PRISK. I think that this would certainly start out as a planning staff, to accomplish the function that I believe you rather well defined in your own remarks a moment ago, precisely what needs to be done in this area of safety, where are the deficiencies and areas that the Federal establishment, in particular, can be of assistance on, not only working independently but in its programs cooperatively with the States, highway, motor vehicle, police, public health authorities, and all of the rest.

And with the industry, I might say.

Mr. ROGERS of Florida. You do not think this could be carried out, for instance, better in the Department of Commerce or in HEW on safety?

Mr. PRISK. Frankly, this proposal, this idea for a single department approach, was given a great deal of consideration before the recommendation was made 2 years ago for the Board. And we felt at that time that it would be unwise to propose that the entire task, which is extremely complex and one that requires many disciplines, be put in one agency. The order that established the Board was circulated to all of the departments concerned and there was no disagreement with this general philosophy that I speak to here.

Mr. ROGERS of Florida. Just offhand, you may be perfectly right and I hope we will go into some of this material. I am not going to proceed any further. Let me say just one thing more.

It is my feeling that you have busy men, who have been proposed members of this committee. You have Secretaries who have very definite responsibilities. To get a board together, with some staff, is not the approach to a problem such as this one. I think you should separate the effort rather than combine the effort. It seems to me that this is one area where we need direct responsibility to carry a very rapid program forward rather than trying to try to call all of these Secretaries together once a month or whenever they are available, once every 2 months, to get it really going.

It would be a surprise, it seems to me, if a multiple responsibility board could operate more efficiently and with greater results than by a board vested in one department and giving it primary responsibility to that department.

Mr. PRISK. I think that you are entirely correct in that it would be difficult, and, perhaps, impossible for these Cabinet people to arrive at any basis for useful work except that their designation as a member of the group of this nature does signify and does lend a

formal outlet, you might say, for the staff which would operate at their behest.

Mr. ROGERS of Florida. To let them get together and carry out what may have been determined by research?

Mr. PRISK. Yes.

Mr. ROGERS of Florida. I can see that, but to have the responsibility to carry on this program, I believe, is beyond reason. Thank you.

Mr. ROBERTS. Thank you.

Mr. RHODES of Pennsylvania. No questions.

Mr. SCHENCK. Mr. Chairman, because of this colloquy here—and I have no desire to prolong this discussion—it made me wonder whether or not you were suggesting that it may be necessary to set up a coordinator of Departments to pinpoint this responsibility similar to the so-called coordinator of regulatory agencies to reach this problem?

There seems to be so much divided opinion, so much difference on this, I could not quite understand it. We tried to do that in the field of aviation, tried to center it in one agency on the question of safety. I wonder if we need a coordinator in order to coordinate?

Mr. ROBERTS. The Chair would certainly like to agree with the gentleman from Florida and the gentleman from Ohio that referring this to the Intergovernmental Highway Safety Board would seem to be just another way of putting off what needs to be done. I say this with all due respect for the Department. But how are we going to know what to do without standards? How is the procurement agencies going to know what to buy in cars except for certain obvious safety devices such as seat belts?

We have no criteria laid down in the departments, that is true. GSA will contend that they could properly prescribe these standards. We know that the ceilings as to the cost will have to be lifted to allow them to take bids for, perhaps, more costly cars.

It seems to me, based on my experience since I have served in Congress, that the best way to get rid of a problem and not to do much about it, is to refer it a board or commission. I think that the people have been kept waiting long enough for these devices which we believe will save lives. And I think that in the Department of Commerce there is already a group that is perfectly capable of determining whether or not a device or design change lends to safety in the car. If the Department of Commerce does not want that responsibility, if they do not want to do anything about it in the Bureau of Public Roads—and I am speaking only for myself—I will be willing to sponsor action to put it in another department where it will be exercised.

We do have, I believe, and will see this week, at least, one department that is willing to take the responsibility to give what, to me, is a minimum amount of safety in vehicles.

I am not familiar with the Board mentioned. Nobody has told me anything about it being organized. This committee has not been consulted. It has not been advised or asked to do anything about it, either, in an advisory capacity or otherwise. How could this committee be willing to shirk its responsibility and turn over this important matter to a committee or commission or board or whatever you call it, if it is not functioning and nobody knows when it will function?

I want to be perfectly fair to the Department of Commerce. I realize that you people are new on the job. You have a lot of problems. But I would appreciate it very much if you gentlemen would go back and reexamine this problem and see if you can come up with a little better answer than trying to refer it to a board or commission that nobody seems to know much about.

That is all I have. Is there anything further?

Mr. THOMSON. No questions.

(The safety program guide follows:)

[Release No. 23; issued Mar. 17, 1961]

U.S. DEPARTMENT OF COMMERCE—OFFICE OF ADMINISTRATIVE OPERATIONS,
SAFETY AND MOTOR VEHICLE DIVISION

SAFETY PROGRAM GUIDE

Subject: Seat belt program.

Purpose: To prescribe actions, beginning during the month of April 1961, to set up a program for the installation and use of automobile seat belts.

BACKGROUND

Research in recent years has shown conclusively that the use of seat belts in all cars could greatly reduce the number of deaths and injuries on our streets and highways. The proven value of seat belts has been reflected in heightened interest in this safety device in both the legislative and executive branches of Government. The Secretary of Health, Education, and Welfare is actively promoting the use of seat belts. The Secretary of Labor has urged all Government agencies to install and encourage the use of belts in support of recommendations made by the Federal Safety Council.

It is appropriate that the Department of Commerce, with its special responsibilities for highway safety, should take the lead in advancing this vital program.

POLICY AND SCOPE

It is the policy of the Department of Commerce to—

- (1) Install seat belts and require their use in all official vehicles except as stated below; and
- (2) Encourage the installation and use of seat belts by employees in their private cars.

Limitations and exceptions

1. The requirements of this program guide are limited to Department of Commerce activities in the continental United States.
2. When the purchase and installation of seat belts would cause the total price of an official passenger car to exceed price limitations set by law, such vehicle is excluded from the requirements of the program.

ACTION STEPS

General

1. April 1961 has been designated Seat Belt Month throughout the Department. Field programs should begin as early as possible in April but may continue into May if necessary.

2. The Secretary will announce the program by memorandum to all employees, to be released about March 24. Bureaus should consider supplementing this notice by appropriate memorandums from bureau or office heads.

Installation of seat belts in official cars

1. Installation of seat belts in official vehicles should be started in April and extended to include all vehicles not excepted from the program as rapidly as budgetary and other limitations permit.

(a) Seat belts shall meet Federal Specification JJ-B-185a. Belts are included in the Federal supply schedule, FSC Class 2540. The cost is \$3.40 each in small quantities.

(b) The General Services Administration will furnish and install seat belts in GSA cars assigned to the Department upon request to the appropriate motor pool official. GSA motor pools will bill the requesting agency directly for the scheduled price of the belt plus installation cost.

(c) The number of belts to be installed in each car will be determined on the basis of use, the minimum installation consisting of belts for the driver and one front seat passenger. Cars which are customarily used for transporting passengers in the back seat will be equipped with a belt for each passenger.

Promotion of seat belts for private cars

1. During the month of April, employee interest should be stimulated by posters, publicity in bureau or employee association publications, special bulletins, and distribution of informational literature on the subject of seat belts. The booklet, "Seat Belts Save Lives" is being provided bureaus by the Department for distribution to employees. Another booklet, "Seat Belts—Safe or Hazardous?" has been provided for distribution to key employees.

2. Wherever possible, employee meetings should be held to acquaint all personnel with the safety value of seat belts. Such meetings will provide an opportunity to distribute literature, inform employees of sources of supply, and urge the early installation of belts in private cars. A film showing the value of belts as proven through crash research is available to bureaus from the Department's Safety and Motor Vehicle Division and should be featured at employee meetings wherever feasible. (Meetings for employees housed in the Main Commerce Building in Washington will be arranged in collaboration with bureau officials by the Safety and Motor Vehicle Division.)

3. Arrangements should be made, wherever possible, for employees to purchase seat belts and have them installed at a favorable price, by suggesting to local sources of supply that they cooperate with the Department in this effort.

(NOTE.—In making any such arrangements, bureau officials must be sure that belts offered meet Federal Specification JJ-B-185a and Society of Automotive Engineers requirements.)

(a) For approximately 6 weeks beginning April 10, belts of an approved type will be offered for sale in Commerce-occupied buildings in Washington, D.C., at vending stands operated by the Washington Society for the Blind. At the National Bureau of Standards headquarters and at Suitland, Md., belts will be offered for sale by the concessionaire at the cafeterias. The price in each case will be \$6.50 per belt.

(b) Persons who wish to make their own installation of belts will find simple instructions for doing so in each package. The price for installation at most service stations and garages in the Washington area is \$1.50 to \$2 per belt, with some price variation depending upon the make and model of the car.

MATERIALS AVAILABLE FROM THE SAFETY AND MOTOR VEHICLE DIVISION

1. "Seat Belts—Safe or Hazardous?" For distribution to key personnel. (Supplies sent to bureau safety officers March 10, 1961.)

2. "Seat Belts Save Lives." For distribution to employees, preferably at meetings. (Will be sent to safety officers about March 24.)

3. "Safety Through Seat Belts," crash research film. A copy of this film will be furnished to each major bureau for circulation during April, and early May if required.

4. Tabletop exhibit. For use at employee meetings. (May be reserved upon request for use in the Washington area only.)

Mr. ROBERTS. Thank you, gentlemen.

Mr. PRISK. Thank you.

Mr. Roberts. Our next witness is Mr. Karl M. Richards, manager of the Automobile Manufacturers Association, Field Services Department; accompanied by Mr. Ralph H. Isbrandt, chairman of the AMA's Engineering Advisory Committee and director of automotive engineering, American Motors Corp.; and Mr. William F. Sherman, manager of the AMA Engineering and Technical Data Department.

STATEMENT OF KARL M. RICHARDS, MANAGER, FIELD SERVICES DEPARTMENT, AUTOMOBILE MANUFACTURERS ASSOCIATION; ACCOMPANIED BY RALPH H. ISBRANDT, CHAIRMAN OF AMA'S ENGINEERING ADVISORY COMMITTEE, AND DIRECTOR OF AUTOMOTIVE ENGINEERING, AMERICAN MOTORS CORP.; AND WILLIAM F. SHERMAN, MANAGER OF THE AMA ENGINEERING AND TECHNICAL DATA DEPARTMENT

Mr. RICHARDS. Mr. Chairman and members of the committee, I am Karl M. Richards, representing the Automobile Manufacturers Association. I should like to introduce two gentlemen accompanying me: Mr. Ralph H. Isbrandt, director, automotive engineering, American Motors Corp., and chairman of the AMA Engineering Advisory Committee; and Mr. William F. Sherman, manager, engineering and technical department of the AMA.

The motor vehicle manufacturers appreciate this opportunity to meet with you again and to present our views on the three bills under consideration, H.R. 2446, H.R. 1341, and H.R. 903, at this one appearance. This is more than a matter of convenience to us. Since there is some interrelationship in these bills, our presentation can be more concise than if separate appearances were made.

We would like to make several recommendations which we believe will be constructive.

Through our previous contacts with this committee, including its visit to the automobile manufacturers' research and testing facilities in 1956, we appreciate your deep concern with public safety and your interest in all matters relating to traffic safety. We also believe that through your explorations and studies of the many facets of highway safety you are aware of the motor vehicle manufacturers' desire to continue to build ever safer motor vehicles and of the research and testing facilities employed for this purpose.

You also know of the activities of both the Automobile Manufacturers Association and our individual member companies in other phases of traffic safety, including cooperation with State officials and with Federal agencies such as the Interstate Commerce Commission and Bureau of Public Roads.

Now, with reference to H.R. 2446:

The motor vehicle manufacturers are aware of the conditions that this bill is designed to correct and we are in complete agreement that there is a need to protect the public from the sale and use of substandard and dangerous hydraulic brake fluid.

It is our opinion that the Federal Government can make a definite contribution toward this objective. Before making our recommendations, we should like to outline briefly what has been done and what is now being done by industry and by the States to control the sale and use of such brake fluid.

THE SAE STANDARD FOR HYDRAULIC BRAKE FLUIDS

Automobile and brake engineers are aware of the special qualities hydraulic brake fluid must possess relating to its boiling point, freezing point, viscosity, and corrosive action on the components of the hydraulic system—rubber hoses and connections. Therefore, to in-

sure the use of reliable brake fluids, the automobile manufacturers requested that the Society of Automotive Engineers develop an SAE standard for hydraulic brake fluid.

Fifteen years ago the Society of Automotive Engineers adopted such a standard. This included a heavy duty specification (70R1) and a moderate duty specification (70R2). It was determined that either fluid would be satisfactory for safe operation of hydraulic brakes in use at that time.

The SAE Hydraulic Brake Fluids Committee was made up of qualified individuals drawn from the brake fluid manufacturing industry, the brake manufacturing industry, the motor vehicle manufacturing industry and the Federal Government.

In 1958, the Society of Automotive Engineers, after considerable study, determined that the brake fluid specifications should be revised to meet the needs of new brake designs. The moderate brake fluid specification designated 70R2 was deleted, and a heavy duty specification calling for a boiling point higher than that of 70R1 was added and designated as 70R3.

This change is a definite upgrading in the quality of brake fluids recommended for use in vehicles manufactured subsequent to 1958 and in the quality of permissible replacement fluids. The SAE specifications are subject to periodic change as warranted.

A list of the current SAE committee members and a copy of the current SAE Standard and Recommended Practice are attached as exhibits A and B.

The motor vehicle manufacturers have always used SAE standard brake fluids in all original equipment. In the replacement field, however, some fluids do not meet the SAE standard.

In one notable example, immediately following World War II, considerable surplus aviation brake fluid made with a petroleum base for use with plastic hoses and connectors came on the market. The fluid caused brake failures by deterioration of rubber brake parts.

State officials were encouraged by the manufacturers of brake fluid, brake components, and motor vehicles to recognize that there must be some regulation of the sale of brake fluids.

THE UNIFORM VEHICLE CODE PROVISIONS ON HYDRAULIC BRAKE FLUID

The first State statute regulating brake fluids was enacted in 1953 in Minnesota. The Automobile Manufacturers Association testified in favor of this bill. And I spoke to the legislature in St. Paul.

To proceed: Following Minnesota experience in administering this law, the AMA requested the National Committee on Uniform Traffic Laws and Ordinances to develop a brake fluid provision as a model which could be recommended for adoption by all States.

After thorough consideration, section 12-305, which reads as follows, was incorporated into the Uniform Vehicle Code in 1956. I think this language is significant, so I will read it:

(a) The term "hydraulic brake fluid" as used in this section shall mean the liquid medium through which force is transmitted to the brakes in the hydraulic brake system of a vehicle.

(b) Hydraulic brake fluid shall be distributed and serviced with due regard for the safety of the occupants of the vehicle and the public.

(c) The (department or official) shall, after public hearing following due notice, adopt and enforce regulations for the administration of this section and shall adopt and publish standards and specifications for hydraulic brake fluid which shall correlate with, and so far as practicable conform to, the then current standards and specifications of the Society of Automotive Engineers applicable to such fluid.

(d) No person shall distribute, have for sale, offer for sale, sell or service any vehicle with any hydraulic brake fluid unless it complies with the requirements of this section.

STATE STATUTES REGULATING THE SALE OF BRAKE FLUIDS

Since 1953, 27 States and the District of Columbia have enacted statutes regulating the sale of brake fluids. These statutes are substantially uniform, and in each case either the statute or the administrative regulation requires conformance to SAE specifications. The motor vehicles registered in these States constitute more than two-thirds, or 68.7 percent, of the total registered in the United States.

These States are listed below according to the years in which their statutes were enacted.

Year 1953: Minnesota.

Year 1954: New Jersey.

Year 1955: California, North Carolina, and Tennessee.

Year 1956: Georgia, Mississippi, and South Carolina.

Year 1957: Arkansas, Oklahoma, Pennsylvania, and Texas.

Year 1958: Alaska, District of Columbia, Louisiana, and Virginia.

Year 1959: Delaware, Florida, Maine, New York, Connecticut, Wisconsin, and Alabama.

Year 1960: Rhode Island, Arizona, Massachusetts, Kentucky, and Michigan.

I call your attention to the fact that the number is increasing. Bills to regulate the sale of brake fluids are now pending in four additional States: Ohio, Colorado, Kansas and New Hampshire.

It will mean, if these bills are passed in these States, that 78 percent of the vehicles in the United States will be covered by these statutes.

To encourage the enactment of such legislation by all the States, the automobile manufacturers have made a continuing effort to supply information to State officials and legislators regarding the problem of substandard fluid. I personally have appeared in, probably more than 20 State legislatures to support the enactment of these statutes. The vehicle manufacturing industry also has made such information available to dealers and other service outlets.

The States which have taken legislative action have employed the SAE standard as a criterion and made use of the terminology of the Uniform Vehicle Code. The legislation enacted has been implemented by various types of regulatory action, which of necessity has included inspection by State officials of stock for sale by service outlets.

The degree of effectiveness already achieved by existing State regulatory procedures is indicated by surveys conducted by the Chemical Specialties Manufacturers Association, which show a marked decrease during recent years in the volume of substandard fluid shipped by the reporting producers.

RECOMMENDATION FOR FEDERAL ACTION

In our opinion, there is one special area in which Federal action could be most helpful to the States' efforts to combat the sale of substandard brake fluids. Certain characteristics of brake fluid products make the problem of regulation difficult.

First, the quality of brake fluid compounds cannot easily be determined or identified at point of sale or after installation.

Second, it is a type of product that is relatively easy to manufacture on a local basis and ship from State to State.

In regard to these problems peculiar to the regulation of brake fluid, we feel that the Federal Government can take action which will effectively support the efforts under way at the State level.

However, we believe such Federal support could be accomplished best by amending H.R. 2446, or by offering a substitute bill which would in effect:

1. Define hydraulic brake fluid as a substance which meets the minimum specifications indicated by the SAE 7OR standard.

2. Require that all containers for hydraulic brake fluid be properly labeled as to the particular SAE 7OR specification with which the contents comply.

3. Make it illegal to ship in interstate commerce any brake fluid not labeled as prescribed above.

That is our recommendation with respect to the brake fluid bill.

Now, as to H.R. 1341: In respect to H.R. 1341, the primary intent of this bill is, first, to provide maximum safety protection to passengers in federally owned vehicles, and, secondly, to set a national example for the public that would encourage greater use of available proven safety devices.

We certainly concur with these objectives. In July 1959, we invited this committee's attention to the fact that every vehicle-using branch of the Federal Government now purchases its vehicles to specifications. Specifications for safety equipment remain a natural part of these purchase orders. With technically competent personnel and adequate facilities for developing nationally recognized performance standards already available to offer guidance, we suggest that it would not be necessary to require that the Secretary of Commerce independently develop and impose standards on safety devices.

Our position in 1959 was supported by departments of the Federal Government most closely concerned with the purchase of vehicles. These include the General Services Administration, the Department of Defense, the Department of Commerce, and the Bureau of the Budget.

OUR RECOMMENDATION FOR FEDERAL ACTION

However, because the motor vehicle manufacturers do see considerable merit in the intent of H.R. 1341, we would like to suggest what we consider a more practical route to the achievement of these ends.

We feel that the aims of the bill would be accomplished most effectively were it amended to direct the Secretary of Commerce to develop recommended procedures for procurement of Federal vehicles incorporating a selected list of available proven safety equipment as the Secretary of Commerce deems appropriate.

To implement this directive, the legislation should authorize establishment of an Automobile Procurement Advisory Committee on Safety Equipment composed of technically qualified and experienced automotive safety engineers and safety specialists from Government and nationally recognized organizations.

Among the organizations represented on this committee might be such Federal Government agencies as the Bureau of Public Roads, Interstate Commerce Commission, Department of Defense, and the General Services Administration; such interstate agencies as the American Association of Motor Vehicle Administrators; and such professional organizations as the Society of Automotive Engineers, the American Standards Association, the American Society for Testing Materials, and the American Society of Mechanical Engineers.

Such an advisory committee, similar in function to those employed by other branches of the Federal Government could assist the Secretary of Commerce in applying present knowledge and standards to Government procurement, help initiate the development of needed additional standards by appropriate bodies and help keep both present and new standards up to date as technological advances are made.

Turning now to H.R. 903: H.R. 903 is essentially the same as H.R. 772 of the 86th Congress, on which testimony was presented by the AMA on July 8, 1959. We reiterate the objection stated then, that such legislation would be both impractical and unnecessary.

This legislation would place in the hands of Federal authority the responsibility for prescribing certain standards for motor vehicles and equipment without regard for the fact that many safety characteristics of an automobile are so basically and intimately involved with all other features of design and performance that isolating them from these other features is not practicable. The great variety of types of cars being produced is a further barrier to workable standardization in this area.

Among the items enumerated in H.R. 903 about which we desire to comment are:

1. Speed governors and horsepower limitations: These subjects were discussed and demonstrated to members of the committee at automobile company proving grounds during visits in 1956. The demonstrations and facts made available then indicate that speed governors and horsepower limitations are not safety improvements. Speed control, as such, of course, is an appropriate safety measure, but the situation has not changed with regard to these proposed solutions. Prevention of excessive speed is essentially a matter of driver control through enforcement and educational measures.

2. Safety padding: This equipment is available in all cars, and is increasingly being accepted as a desirable feature by many motorists. We have submitted technical information for your committee record on previous occasions, such as July 8, 1959. To accomplish the objective of reduction of crash injuries, we must consider the design of the complete structure as well as the nature and applications of padding. The latter is therefore not susceptible to consideration as an isolated item in terms of the end result sought.

3. Steering and other vehicle controls: The design of these basic components of vehicles is integrated with the design of the complete vehicle. Therefore, standardization of such items separately is not practical.

4. Bumpers, fenders and other shock-absorbing equipment: Shock-absorbing capabilities of the vehicle are determined by overall design rather than that of individual components. Item-by-item standardization is therefore impractical.

5. Headlights and other lights: Approximately 36 pages of lighting standards have been promulgated and published by the Society of Automotive Engineers. They have been developed by the automobile industry in cooperation with the American Association of Motor Vehicle Administrators (involving State and Federal participation) and the lamp manufacturing industry. Lighting equipment is under rigorous control by the States and the Interstate Commerce Commission. The controls include initial testing of prototypes, sample testing of production items, formal approval of States after review of reports by independent laboratories, marking and labeling for identification of approved types, and periodic inspection during use.

6. Brakes: Brakes are subject to performance requirements stated in the Uniform Vehicle Code and by the ICC. Component parts have been covered by SAE standards for many years.

7. Aids to visibility, including rear vision mirrors: There are now standards on glazing materials, State regulations on visibility factors, and State requirements on mirror installations. An SAE committee is concentrating efforts on further improvements of rear vision. Technical reports are made at intervals to the AAMVA Committee on Engineering and Vehicle Inspection.

8. Tires: Performance and durability of tires have been greatly increased over the years. Tire problems today are mainly concerned with improper use, maintenance and replacement.

On most of the foregoing items, the need for inspection and maintenance is very important. Possibly the greatest mechanical safety problem today is the lack of adequate maintenance by owners. Automobile manufacturers constantly promote good maintenance by incorporation of information in owners' manuals, educational campaigns, mechanic training, dealer maintenance programs and endorsement of State legislation for periodic inspection. As a special effort, automobile manufacturers and dealers—through the Auto Industries Highway Safety Committee—attempt each year in voluntary safety checks to encourage proper maintenance by owners in jurisdictions where no State inspections are required.

For reasons enumerated above, we oppose H.R. 903. Furthermore, going beyond the specific proposals of this particular bill, it is our firm conviction that the progress of vehicle safety, and the public interest generally, will be better served by the procedures now in effect, procedures which continue to grow in effectiveness. Federal control over motor-vehicle design and engineering standards, in our opinion, would retard progress in this vital field.

THE NATURE OF ENGINEERING STANDARDS

We are pleased that members of this committee are aware of the importance of adequate standards for safety equipment. In considering legislative proposals such as those being discussed here today, we feel it is important to have a clear understanding of the meaning and application of engineering standards.

We should like to take a few moments in closing our presentation to discuss the basic concept of engineering standards and their implications to regulatory measures.

The automotive industry initiated, shortly after 1900, the concept of engineering standards employed throughout American industry today. Basically, the concept is that an engineering standard should spell out performance requirements rather than design details and that standards should be voluntarily developed and applied, with the way left open for improvement or change in response to competitive technological progress.

The industry established the principle that independent, professional engineering societies provide an ideal way for the voluntary exchange of information, and ideas about solutions to engineering problems, with the incorporation of the best available knowledge into documents called standards.

This course was selected when the industry trade association disbanded its own standards committees and based its work primarily on SAE standards.

From the beginning, it was obvious that these standards could not be written ahead of the time that sound engineering practices develop in a particular field. Attempts to prescribe an idea or design by writing a standard is not practical.

Standardization committees in technical societies are composed of highly qualified and experienced engineers, selected to provide a cross section of essential talents and knowledge. In many instances, Government engineers serve on these committees. Thus, when standards are adopted by industry and Government, there is assurance that full consideration has been given to all aspects of the problem. We attach for the record lists of committee members dealing with standards for several kinds of automotive safety equipment.

Technical society standards committee personnel have, in addition to road experience, a comprehensive knowledge of industry technical practices, wide acquaintance with industry research and development potentials, and extensive testing facilities.

In order for a Government agency to write workable automotive standards, an extensive duplication of such industry background and facilities would be required, with the best result that could be anticipated being a virtual duplication of standards already available and in use.

These standards have been developed and are constantly being reviewed by such groups as the American Society for Testing Materials, the American Society of Mechanical Engineers, the American Standard Association, and the Society of Automotive Engineers.

The various Federal and State agencies, including the Department of Defense, the Federal Aviation Agency (for aviation components), and State motor vehicle administrators, rely on them. The automobile industry itself depends upon the same standards in its own design and engineering programs.

SUMMARY

Gentlemen, we conclude our testimony on these three bills with a reiteration of our appreciation for the opportunity to tell you our views. We would like to summarize these.

With respect to H.R. 2446 on hydraulic brake fluids, we believe that the existing standards and procedures in the States take care of a major part of the problem of controlling the distribution and use of

substandard brake fluids. However, we do see an area in which the Federal Government has a unique and important function helpful to State administrative and enforcement activities. We believe this function could best be fulfilled by amending H.R. 2446, or by offering a substitute bill, to provide for Federal labeling requirements to reinforce the State efforts.

With respect to H.R. 1341, we concur with the objective of including the purchase of proven available safety devices on Government-operated vehicles. However, we do not believe it is necessary or desirable to provide for the establishment of standards for such devices by the Secretary of Commerce.

We recommend instead that an Advisory Committee on Safety Equipment be established to develop recommended procedures to guide Federal agencies in procurement of such safety equipment. We propose the modification of H.R. 1341 to include this suggestion.

With respect to H.R. 903, we are opposed to this bill because we do not endorse the principle of mandating Federal standards on motor vehicle design. In our opinion, this is impractical and unnecessary.

ACTIONS ON SEAT-BELT INSTALLATIONS

At our last meeting with your committee, you expressed considerable interest in seat belts and their attachments. It was generally agreed that there was need for a seat belt public education program. We also advised that we were seriously considering the development of methods to facilitate belt attachment.

We would like today to report to your committee on action taken by vehicle manufacturers since that time with regard to seat-belt installations.

As you know, an educational campaign on the value of seat belts has been undertaken, sponsored by the U.S. Public Health Service, National Safety Council and American Medical Association.

Vehicle manufacturers are cooperating in this campaign, through such actions as distributing television films and other materials, including millions of copies of supporting booklets. Seat belts are also being installed in driver training cars loaned to high schools under manufacturer-dealer cooperative programs.

Because of the current upturn of public interest in seat belts and to make it easier and less expensive for motorists to install seat belts, the manufacturers will provide seat-belt anchorages for the front seats of 1962 model cars, in addition to identification of location points on the floor structure for rear-seat anchorages.

We believe that these actions will stimulate further interest in seat-belt installations and use, and hope that many more motorists will be encouraged to use this safety equipment.

Mr. ROBERTS. I note that you recommend H.R. 1341 and H.R. 2466.

Mr. RICHARDS. That is correct.

I should like, particularly, to invite your attention to the discussion relative to the standards, which is in the nature of engineering standards. This, Mr. Chairman, appears to be a subject not too well understood and it is one of such great importance, and it does enter into the consideration of all of these three bills and we would like to recommend that be given careful study.

And then, if I might conclude with one observation, I note from your program that you have listed a witness to discuss the matter of automobile safety glass. And I might point out that this is a problem that we have been dealing with for about 4 years now, and bills have been presented in over a dozen States. And after demonstrations have been given to the members of the legislatures in these States, bills were introduced that, after we had had an opportunity to present the fact, they had been killed in each State, or not being acted on at this time. So we would like to ask if you have any questions with respect to automobile safety glass that we be given an opportunity to bring in the manufacturers of safety glass and the glass exports, to present the facts to you.

Mr. ROBERTS. That will have to be after the glass people have testified, when we may have some questions on that. We do not know at the present time what they will say.

Thank you very much for your statement, Mr. Richards. I notice that you make reference to the fact that the industry has agreed to supply safety-belt attachments or anchorages, however you want to call it, in the 1962 models for the attachment of safety belts. The Chair is very happy to know that that forward step has been taken, so far as the automobile manufacturers are concerned.

With reference to H.R. 1341, in your statements about the advisory committee, it occurs to me that with proper language in the report of the bill that we could insist that it was the legislative intent in passing the bill that the Department of Commerce would call in each one of the groups you have mentioned to assist, which, I believe, would make it unnecessary to write the language into the bill. That has been the manner in which it has been handled with the refrigerator safety law that the Department of Commerce now administers. And I would like to assure you, as representing the industry, that it would be the purpose of this committee to write into the report such language so that there would be no mistake about what is intended. This would be the advice that would be offered to the Department of Commerce on which safety standards published in the Federal Register would have to be based.

We recognize that the industry is, certainly, well qualified in this field, together with the other groups that you have mentioned. A good job could be done without hurting the industry, and it would be very helpful to the public.

I want to thank you again for your statement. The documents you have attached to your statement will be made a part of the record.

(The documents follow:)

Personnel of Society of Automotive Engineers Brake Committee

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D. E. Goss	GMC Truck & Coach Division, GMC
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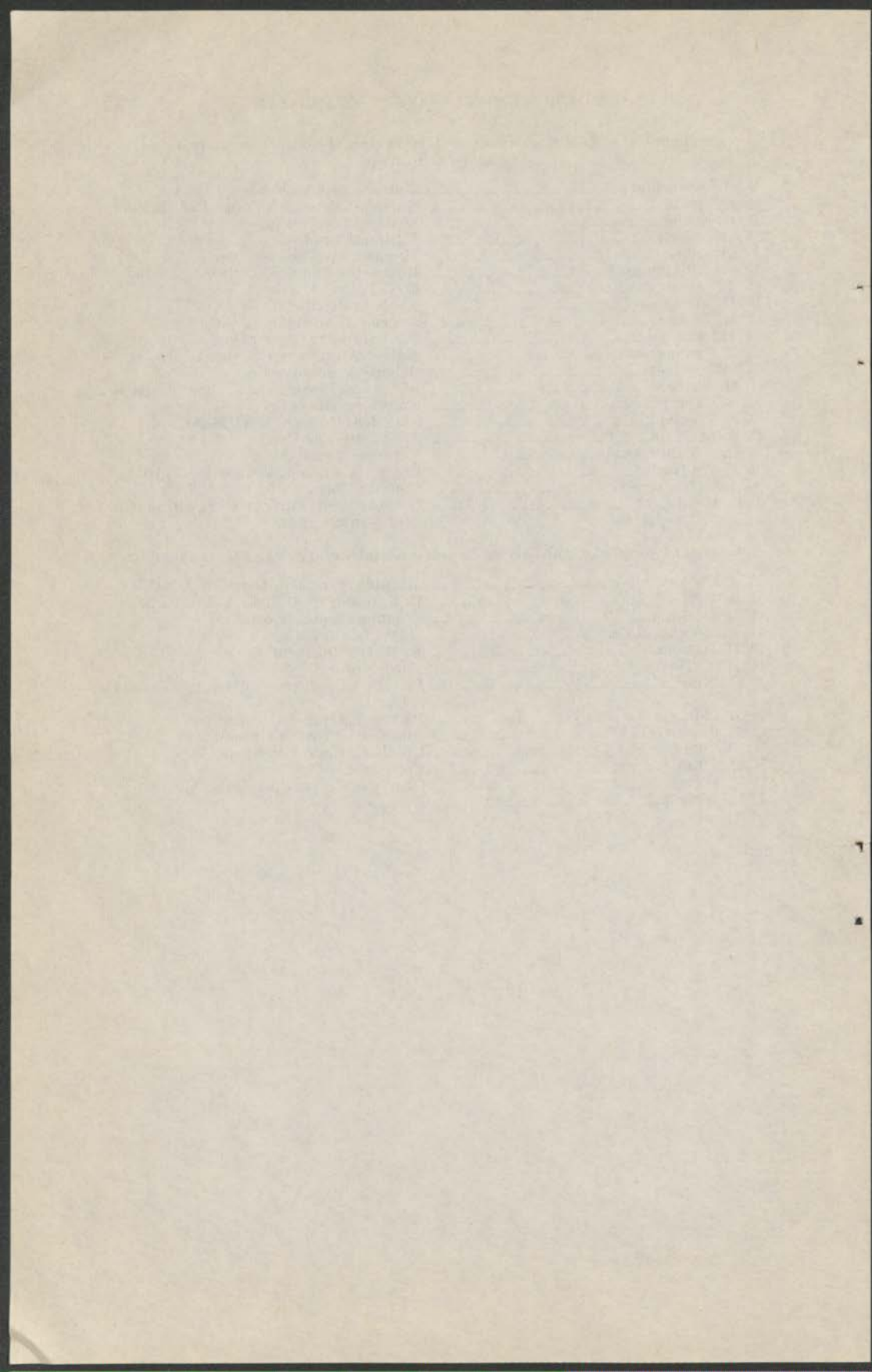
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Personnel of ASTM Committee B-3, corrosion of nonferrous metals and alloys—Continued

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**S
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**SAE STANDARD
RECOMMENDED PRACTICES**

Hydraulic Fluids

TR-203

Cooperative Engineering Program

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HYDRAULIC BRAKE FLUID (SAE 70R)

SAE Standard

Report of Nonmetallic Materials Committee approved December 1946
and last revised June 1960.

HEAVY DUTY TYPE (SAE 70R1)

1.0 Type—These specifications cover brake fluids of the nonmineral oil type for use in the atmospheric range of approximately 140 to -60 F in highway vehicles where the brake fluid is exposed to normal operating conditions.

2.0 Material—The materials used shall be such that the resulting compound will conform to the requirements of these specifications.

3.0 Detail Requirements—Hydraulic brake fluids covered by these specifications shall be in accordance with Table 1, Table 2, and sections 3.1 to 3.7, inclusive.

3.1 Corrosion—The fluid when tested under conditions outlined in section 4.8 shall not cause corrosion exceeding the limits shown in Table 2. The fluid-water mixture shall show no gelling at room temperature and shall not contain more than a medium¹ precipitate.

Discoloration or slight generalized etching of the test strips shall not be cause for rejection of the fluid.

3.2 Boiling Point Change—The boiling point shall not be less than 295 F after the fluid has been held at 295 F for 2 hr in accordance with section 4.9.

3.3 Rubber Swelling—The increase in the base diameter of natural rubber cups³ after 120-hr exposure to the fluid, as described in section 4.10, shall not be less than 0.005 in. and not more than 0.050 in. The surface of the rubber shall not be tacky or show any sloughing as indicated by carbon black on the surface.

3.4 Compatibility—Fluid shall be transparent, however, a slight opalescence is permissible. Fluid shall show no stratification, separation, precipitation, or crystallization when tested under section 4.11.

3.5 Lubrication—At the end of the stroking test, outlined in section 4.12, the metal parts shall be free from wear, corrosion, or galling which

¹ The following are definitions for types of precipitates:

A trace precipitate shall be flocculent and remain in suspension.

A light precipitate shall be flocculent, may settle, but possess no crystalline formations.

A medium precipitate shall be primarily flocculent material with a few small crystals.

A heavy precipitate shall be large in volume and contain both flocculent and crystalline material.

³ Goodrich Compound 15 M 800 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

would impair operation. The rubber parts shall be in a satisfactory operating condition. Excessive leakage past the pistons shall be cause for rejection of the fluid.

3.6 Residue and Corrosion—When tested in accordance with section 4.13, the brake fluid shall cause no rust or corrosion of the metal parts and shall show no dry, hard, or gummy residue.

3.7 Evaporation

Percentage—Not more than 80% (by weight) of the hydraulic brake fluid shall be evaporated when it is subjected to the test described in section 4.5.

Quality of Residue—The residue from the evaporation test described in section 4.5 shall be liquid and shall not contain more than a small amount of precipitate. Any such precipitate shall break up under rubbing with the fingertip to form a smooth nonabrasive paste or a smooth nonabrasive semifluid substance. The residue shall remain liquid while held at 32 ± 2 F for 2 hr.

4.0 Methods of Test—The fluid sample shall be tested, using the methods prescribed in sections 4.1 to 4.13, inclusive.

4.1 Viscosity—The viscosity of the fluid shall be determined in a capillary pipette according to procedure outlined by ASTM D 445.

4.2 Cold Tests

(a) Cold Test A shall be determined by maintaining two 125 cc oil-sample bottles, each containing 100 cc of the fluid, at -40 F for 6 days. At the end of this period one bottle shall be tilted from the vertical to the horizontal position and the time that flow begins shall be recorded. The second bottle shall be quickly wiped with a clean lint-free cloth saturated with alcohol or acetone and then quickly placed against a standard hiding power test chart.⁶ The diagonal black contrast lines on the chart shall be clearly discernible when viewed through the fluid in the bottle. The fluid shall also be visually examined for evidence of stratification, separation, precipitation and crystallization.

(b) Cold Test B shall be determined by maintaining a 125-cc oil-sample bottle containing 100 cc of the fluid at -60 F for 6 hr. At the end of this period, the bottle is to be tilted from the vertical to the horizontal position, and the time that flow begins is to be recorded.

4.3 Boiling Point—The apparatus required (Fig. 1) consists of a 100-cc round-bottom shortneck flask having a 19/38 female ground-glass joint, and a 10-mm OD side-entering tube, a thermometer (ASTM 2F-53 or equivalent), and a straight-tube 200-mm jacket-length Liebig condenser, equipped with a 19/38 drip-tip male ground-glass joint at its lower end. Also three or four pieces of unglazed porcelain, each about 4 mm in diameter, are required. These are made by breaking up a porous plate made of unglazed porcelain, their function being to prevent superheating during the test.

A 60-cc sample of the fluid together with three or four pieces of porous plate shall be placed in the flask, the condenser attached, and the ther-

⁶ The standard hiding power test chart must be used to assure uniformity of testing. A suitable hiding power chart is described in ASTM D 344-39 and D 406-39.

momometer inserted through the side tube to within $\frac{1}{4}$ in. of the bottom center of the flask. A seal shall be made around the thermometer with a short piece of rubber tubing. The flask shall be mounted on an asbestos-centered wire gauze and the whole assembly held in place by a clamp. The condenser water is turned on and heat applied by a bunsen burner or electric heater at such a rate that the fluid is brought to its boiling point in 10 min. The rate of reflux is then adjusted over another 10-min period to approximately 1 drop of reflux per sec. The temperature is then read, and after being corrected for barometric pressure according to ASTM D 86, it is taken as the boiling point.

Fluids boiling above 300 F may be considered satisfactory if a new sample is not refluxing at a greater rate than 1 drop per sec after being held at 300 F for 10 min.

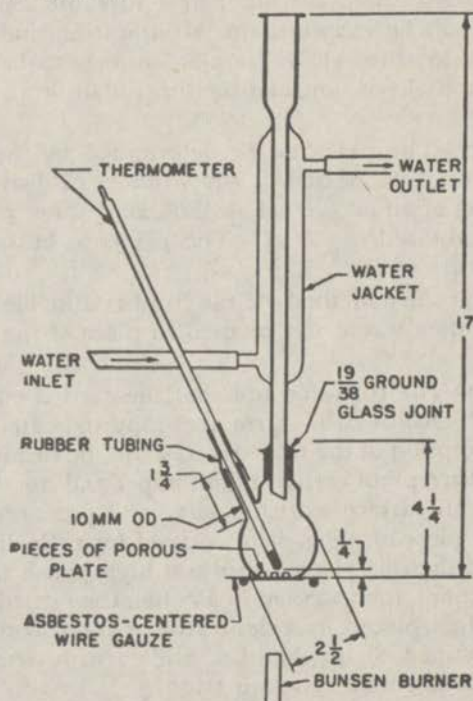


FIG. 1—APPARATUS FOR DETERMINING BOILING POINT

4.4 Flash Point—The flash point of the fluid shall be determined by the Cleveland open-cup method.

4.5 Evaporation

Percentage—Evaporation of the fluid shall be determined by placing a 10-cc sample in a clean, dry, weighed, covered Petri dish of approximately 100 mm in diameter and 15 mm high and weighed with cover in place to the closest 0.01 g. The Petri dish and fluid shall then be placed on the inverted Petri-dish cover in a 210 ± 5 F air bath, free from drafts, for 48 hr. After this time, the Petri dish and cover shall be removed from the air bath, allowed to cool in a desiccator, and reweighed to

determine the weight of fluid remaining.

The per cent evaporation shall be calculated as follows:

$$\text{Per cent evaporation} = \frac{W - R}{W} \times 100$$

where

R = weight of residue after heating

W = initial weight of sample

Quality of Residue—The residue remaining after the test outlined in section 4.5 (percentage) shall be examined for liquidity and for the amount and nature of the precipitate. The residue shall then be held at a temperature of 32 ± 2 F for 2 hr and then examined for liquidity.

4.6 Water Tolerance—Two 100-cc samples of fluid shall each be mixed with $3\frac{1}{2}$ cc of distilled water. One sample shall be maintained at a temperature of 140 F and the other at -40 F for a period of 24 hr each, and both shall be examined for stratification and precipitation. At the end of 24 hr, the -40 F sample bottle is to be tilted from a vertical to a horizontal position, and the fluid shall begin to flow within 5 sec.

4.7 Neutrality—The pH shall be determined by the electrometric method. To the fluid is added 5% (by volume) of distilled water and 100% (by volume) of an 80% ethyl alcohol, 20% water mix, which mix shall have been adjusted to 7.0 pH. The pH is to be taken at a fluid mixture temperature of 75 ± 15 F.

Alternative Neutrality Method—If the fluid is miscible with an equal volume of water, then water may be used in place of the above alcohol-water mixture.

4.8 Corrosion—The corrosion test shall be carried out as follows:

The test strips², each of 20-35 sq cm area (approximately $3\frac{1}{2} \times \frac{1}{2}$ in.), shall, with the exception of the tinned-iron strips, be cleaned by abrading them with 320A waterproof carborundum paper and stoddard solvent, or equivalent, until all surface scratches, cuts, and pits are removed from the strips. A new piece of paper is to be used for each different type of metal. They shall then be given a medium high polish by means of 00 steel wool and alcohol, then washed in alcohol, then dried with a stream of dry air, and then placed in a desiccator at room temperature until equilibrium is attained. Strips shall be handled with clean forceps after polishing to avoid fingertip contamination.

The strips shall be weighed to nearest 0.1 mg. The weighed strips, arranged in the order of tinned iron, steel, aluminum, cast iron, brass, and copper, shall be joined in metal-to-metal contact by fastening with a steel bolt or cotter pin passed through holes drilled near one end of each strip. The strips shall be so bent that, except for the small terminal area near the bolt or cotter pin, the strips shall not be in direct contact one with another. Strips should be immersed in alcohol to eliminate fingerprints and then handled with forceps. The strips shall then be inserted into a 1-pt Mason jar in such manner that the bolted ends shall

² Test strips may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

rest within the concavity of a new natural rubber cup³. The 350 cc of the fluid to be tested, diluted with 5% (by volume) of distilled water and heated to approximately 200 F, shall then be poured into the test jar to submerge totally the test strip assembly. The glass cover shall then be clamped on in a vapor tight manner with the aid of a conventional Mason-jar rubber gasket and the test vessel held for 120 hr in an oven at 210 ± 5 F. At the end of the test period the strips are to be removed, the adhering fluid flushed off with water, the individual strips disengaged one from the other and cleaned to remove any adhering corrosion products.

The strips shall first be washed with a cloth wet with a 1:1:1 mixture of alcohol, acetone, and benzol to remove varnish, lacquer, and similar coatings. Coarse abrasives such as wire brushes or steel wool shall not be used for cleaning following the corrosion test, but a mild nonabrasive soap or solvent is permitted. Cleaning is completed by rinsing in water, then in alcohol, drying with a jet of air, and bringing to equilibrium in the desiccator. The cleaned strips shall then be weighed to nearest 0.1 mg. Corrosion loss is determined by dividing the difference in weight of each specimen before and after the test by the total exposed surface area of the specimen as measured in square centimeters.

The average of three tests shall be the corrosion loss.

4.9 Boiling Point Change—A 60-cc sample of fluid is placed in boiling point equipment, as described in section 4.3, and held at 295 F for 2 hr. After being held at 295 F for 2 hr, the boiling point shall not be less than 295 F.

4.10 Rubber Swelling—Absorption of liquid by rubber cups and washers used in the hydraulic brake systems shall be tested as follows:

Cups—The cups used shall be 1¼-in. natural rubber cups³ and should not be more than nine months old from date of production. Cups shall be free of lint and dirt, the base diameter determined to the nearest thousandth of an inch with a micrometer, and the diameter recorded. In measuring base diameter of a cup, care shall be taken that the micrometer does not extend more than 1/32 in. beyond the bottom edge of the cup. The diameter shall be taken as an average of two readings at right angles to each other. If these two diameters differ more than 0.003 in., the cup shall be discarded.

Procedure—Two cups, whose base diameters have been measured, shall be immersed in 75 cc of the fluid under test, in an 8-oz screw-cap glass bottle and held at a temperature of 158 ± 2 F for a period of 120 hr. After 120-hr exposure, the cups shall be removed from the bottle, washed quickly with alcohol, dried with the clean cloth, and measured across the base with a micrometer as before. This measurement shall be within 10 min after taking the cup out of the fluid. The surface of the cups shall be visually examined.

³ Goodrich compound 15 M 800 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

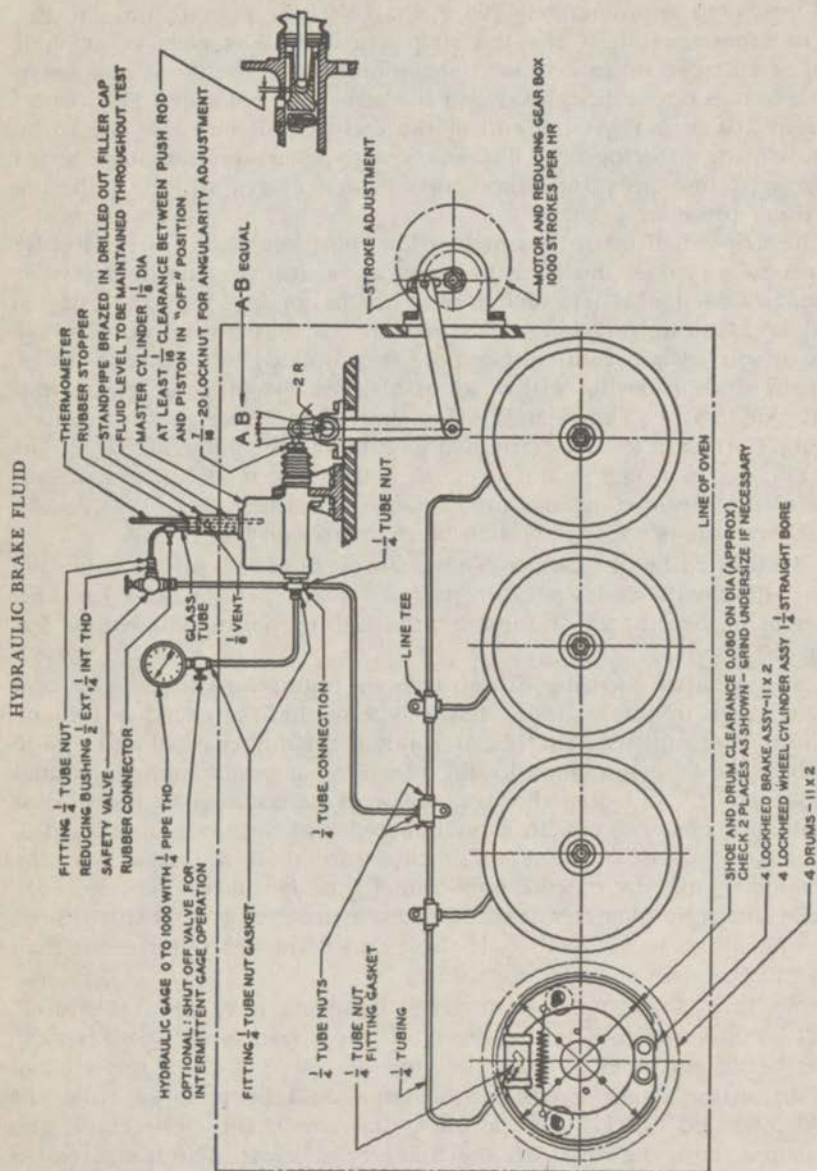


FIG. 2-STROKING TEST APPARATUS

TABLE 1—REQUIRED TESTS

Tests	Test Limits
Viscosity (Kinematic) at -40 F, max	1800 Centistokes
Viscosity (Kinematic) at 130 F, min	4.0 Centistokes
Cold Test A (6 days at -40 F)	Shall begin to flow within 5 sec after the sample bottle is tilted from the vertical to horizontal position. Shall be transparent, however, a slight opalescence is permissible. No stratification, separation, precipitation, or crystallization.
Cold Test B (6 hr at -60 F)	Shall begin to flow within 5 sec after the sample bottle is tilted from the vertical to horizontal position.
Boiling point, F, min	300
Flash point, F, min	145
Water tolerance (3.5 cc of distilled water at 140 and -40 F)	Shall begin to flow within 5 sec after the sample bottle is tilted from the vertical to horizontal position. No stratification—a light ^a precipitate allowed.
Neutrality	pH 7 to 11
Neutrality (after corrosion test)	pH 6 to 11

^a The following are definitions for types of precipitates:

A trace precipitate shall be flocculent and remain in suspension.

A light precipitate shall be flocculent, may settle, but possess no crystalline formations.

A medium precipitate shall be primarily flocculent material with a few small crystals.

A heavy precipitate shall be large in volume and contain both flocculent and crystalline material.

4.11 Compatibility—Prepare a mixture consisting of 50 parts, by volume, of the brake fluid under test, and 50 parts, by volume, of the Standard Compatibility Test Brake Fluid.⁵ 100 cc of this fluid mixture shall be placed in each of two 125 cc oil sample bottles. One bottle shall be held for 24 hr at 140 F and the other for 24 hr at 140 F and the other for 24 hr at -40 F. The bottle which has been maintained at -40 F shall be quickly wiped with a clean lint-free cloth saturated with alcohol or acetone and then quickly placed against

TABLE 2—CORROSION LOSSES

Test Strip ^a	Max Permissible Corrosion Loss, mg sq cm of Surface
Tin coated iron cut from 1.19 lb per base box minimum sheet (Type 1, Grade 1 of Federal Specification QQ-I-706A)	0.2
Steel, SAE 1010 (cold rolled)	0.2
Aluminum, SAE 24	0.1
Cast iron, SAE 111, or strips from housings of wheel brake cylinders (smooth machine surface)	0.2
Brass, SAE 70A	0.5
Copper, SAE 71	0.5

^a Test strips may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

⁵ The Standard Compatibility Test Brake Fluid is a composite mixture of representative brake fluids meeting SAE 70R used in new car production. Standard Compatibility Test Brake Fluid may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41st St., New York 17, N. Y. Use of this fluid or its equivalent promotes uniformity of test results.

a standard hiding power test chart.⁶ The diagonal black contrast lines on the chart shall be clearly discernible when viewed through the fluid-mixture in the bottle. Both test mixtures shall be visually examined for evidence of stratification, separation, precipitation and crystallization.

4.12 Lubrication—The following test procedure is intended for use in evaluating the lubricating quality of the brake fluid.

4.12.1 A typical apparatus consists of:

- (a) One hydraulic brake system master cylinder of 1½-in. diameter.
- (b) Four brake assemblies having 1½ or 1¼-in. diameter wheel cylinders, together with brake drums.
- (c) A pressure relief or safety valve set for operation at a pressure of 500 ± 50 psi.
- (d) A pressure gage satisfactory for operation at a pressure of 500 ± 50 psi.

NOTE: A diagrammatic sketch of a suitable form of apparatus is shown in Fig. 2. Additional information on suitable stroking equipment may be found in Fig. 6 of SAE Standard, Rubber Cups for Hydraulic Actuating Cylinders (SAE 60R).

4.12.2 The master- and wheel-cylinder castings shall be of cast iron, and the pistons shall be of an unanodized aluminum alloy.

4.12.3 Fifteen feet of ¼-in. OD copper tubing shall be used in assembling the apparatus.

4.12.4 The apparatus shall be enclosed in a heated air bath controlled to a temperature of 158 ± 5 F in the fluid in the master cylinder reservoir.

NOTE: When strip heaters are used, they shall be placed 6 or more in. from cylinders on test.

4.12.5 Mechanical application of pressure to the master push-rod shall be employed to simulate operation on the vehicle as closely as possible.

4.12.6 All rubber parts shall be of natural rubber meeting SAE 60R1.⁷

NOTE: New master- and wheel-cylinder units shall be purchased unassembled and must not be used for more than one test. No parts shall be used in any test unless these are in satisfactory condition on inspection prior to assembly of the apparatus. New rubber cups which shall not be more than nine months old from date of manufacture must be employed for each test.

4.12.7 Test Procedure—The test procedure to be employed is as follows:

- (a) The rubber and metal test parts shall be washed or flushed with alcohol, dried, and inspected for corrosion or other defects.
- (b) The fluid lines shall be cleaned and flushed with alcohol and blown dry with dry air.

⁶ The standard hiding power test chart must be used to assure uniformity of testing. A suitable hiding power chart is described in ASTM D 344-39 and D 406-39.

⁷ For information on rubber parts contact Chemical Specialties Mfg. Assn., Inc., 50 East 41st St., New York 17, New York.

(c) Immediately after inspection, the test parts shall be dipped into and coated with the fluid to be tested, the apparatus assembled, and the test conducted promptly.

(d) The test fluid shall then be introduced into the apparatus and the system bled free of air.

(e) The stroke of the master-cylinder push-rod shall be adjusted to be as nearly as possible along the centerline of the cylinder, to avoid side thrust and excessive wear.

(f) At the start of the test, the brake shoes shall be adjusted concentric with the brake assembly axis to provide a diametral clearance of 0.080 in. between the shoes and the drums (0.040 in. clearance on each side).

(g) The stroke shall be adjusted to give a maximum pressure of 500 ± 50 psi as measured by a pressure gage installed in the fluid line.

(h) Stroking shall be at the rate of 1000 ± 100 strokes per hr, and the tests shall be continued for a total of 150,000 strokes.

(i) At the end of the test, the condition of the parts as disassembled shall be noted, following which the parts shall be washed with alcohol and further inspected immediately.

(j) If mechanical difficulties which cannot be attributed to the fluid are encountered during the test, the test shall be repeated.

4.13 Residue and Corrosion—A complete brake wheel cylinder assembly ($1\frac{1}{4}$ in. in diameter), except boots, having an iron housing, natural rubber test cups³, and aluminum pistons shall be used for the test. It shall be carefully cleaned to remove all traces of residual brake fluid or rust preventive oil. After cleaning, the parts shall be rinsed with alcohol and dried. All parts shall then be assembled using a wire or clamp to hold the pistons approximately $\frac{1}{4}$ in. inside the cylinder. While assembling, each part shall be dipped into the brake fluid under test. After assembly, 5 ml of the brake fluid under test shall be added to the assembly through the inlet connecton. The bleeder opening shall be tightly closed. With the inlet connection fitting removed, the assembly shall be placed in an oven with the bleeder connection in an upward position. The assembly shall be kept in the oven at temperature of 158 ± 5 for 14 days. After the 14 days, the assembly shall be carefully disassembled to observe conformance with the requirements specified in section 3.6.

MODERATE DUTY TYPE (SAE 70R2) HAS BEEN DISCONTINUED

HEAVY DUTY TYPE (SAE 70R3)

5.0 Type—These specifications cover brake fluids of the nonmineral oil type for use in the atmospheric range of approximately 140 to -60 F, in highway vehicles where the brake fluid is exposed to severe operating conditions.

6.0 Material—The materials used shall be such that the resulting compound will conform to the requirements of these specifications.

³ Goodrich compound 15 M 800 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

TABLE 3—REQUIRED TESTS

Tests	Test Limits
Viscosity (Kinematic) at -40 F, max	1800 Centistokes
Viscosity (Kinematic) at 130 F, min	4.0 Centistokes
Cold Test A (6 days at -40 F)	Shall begin to flow within 5 sec after the sample bottle is tilted from the vertical to horizontal position. Shall be transparent, however, a slight opalescence is permissible. Shall show no stratification, separation, precipitation, or crystallization.
Cold Test B (6 hr at -60 F)	Shall begin to flow within 5 sec after the sample bottle is tilted from the vertical to horizontal position.
Boiling point, F, min	375
Flash point, F, min	180
Water tolerance (3.5 cc of distilled water at 140 and -40 F)	Shall begin to flow within 5 sec after the sample bottle is tilted from the vertical to horizontal position. Shall be transparent, however, a slight opalescence is permissible. Shall show no stratification, separation, precipitation, or crystallization.
Neutrality	pH 7 to 11
Neutrality (after corrosion test)	pH 6 to 11

TABLE 4—CORROSION LOSSES

Test Strip ^a	Max Permissible Corrosion Loss, mg sq cm of Surface
Tin coated iron cut from 1.19 lb per base box minimum sheet (Type 1, Grade 1 of Federal Specification QQ-I-706A)	0.2
Steel, SAE 1010 (cold rolled)	0.2
Aluminum, SAE 24	0.1
Cast iron, SAE 111, or strips from housings of wheel brake cylinders (smooth machine surface)	0.2
Brass, SAE 70A	0.5
Copper, SAE 71	0.5

^a Test strips may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

7.0 Detail Requirements—Hydraulic brake fluids covered by these specifications shall be in accordance with Table 3, Table 4, and sections 7.1 to 7.7, inclusive.

7.1 Corrosion—The fluid when tested under conditions outlined in section 8.8 shall not cause corrosion exceeding the limits shown in Table 4. The fluid-water mixture shall show no gelling at room temperature and shall not contain more than a medium¹ precipitate.

Discoloration or slight generalized etching of the test strips shall not be cause for rejection of the fluid.

7.2 Boiling Point Change—The boiling point shall not be less than 370 F after the fluid has been held at 370 F for 2 hr in accordance with section 8.9.

¹ The following are definitions for types of precipitates:

A trace precipitate shall be flocculent and remain in suspension.

A light precipitate shall be flocculent, may settle, but possess no crystalline formations.

A medium precipitate shall be primarily flocculent material with a few small crystals.

A heavy precipitate shall be large in volume and contain both flocculent and crystalline material.

7.3 Rubber Swelling

7.3.1 Natural Rubber Test Cup³ Swelling—The increase in the base diameter of the cups after 120-hr exposure to the fluid, as described in section 8.10, shall not be less than 0.005 in. and not more than 0.050 in. The surface of the rubber shall not be tacky or show any sloughing as indicated by carbon black on the surface.

7.3.2 Standard SBR Rubber Test Cup⁴ Swelling—The increase in the base diameter of the cups after 70-hr exposure to the fluid, as described in section 8.10, shall not be less than 0.005 in. and not more than 0.055 in. The surface of the rubber shall not be tacky or show any sloughing as indicated by carbon black on the surface.

The precipitation characteristics of the fluid with standard SBR rubber cups shall not be classified as more than a medium precipitate.

7.4 Compatibility—Fluid shall be transparent, however, a slight opalescence is permissible. Fluid shall show no stratification, separation, precipitation, or crystallization when tested under section 8.11.

7.5 Lubrication—At the end of the two stroking tests outlined in section 8.12, the metal parts shall be free from wear, corrosion, or galling which would impair operation. The rubber parts shall be in a satisfactory operating condition. Excessive leakage past the pistons shall be cause for rejection of the fluid.

7.6 Residue and Corrosion—When tested in accordance with section 8.13, the brake fluid shall cause no rust or corrosion of the metal parts and shall show no dry, hard, or gummy residue.

7.7 Evaporation

Percentage—Not more than 80% (by weight) of the hydraulic brake fluid shall be evaporated when it is subjected to the test described in section 8.5.

Quality of Residue—The residue from the evaporation test described in section 8.5 shall be liquid and shall not contain more than a small amount of precipitate. Any such precipitate shall break up under rubbing with the fingertip to form a smooth nonabrasive paste or a smooth nonabrasive semifluid substance. The residue shall remain liquid while held at 32 ± 2 F for 2 hr.

8.0 Methods of Test—The fluid sample shall be tested, using the methods prescribed in sections 8.1 to 8.13, inclusive.

8.1 Viscosity—The viscosity of the fluid shall be determined in a capillary pipette according to procedure outlined by ASTM D 445.

8.2 Cold Tests

(a) Cold Test A shall be determined by maintaining two 125 cc oil-sample bottles, each containing 100 cc of the fluid, at -40 F for six days. At the end of this period one bottle shall be tilted from the vertical to the horizontal position and the time that flow begins shall be recorded. The second bottle shall be quickly wiped with a clean

³ Goodrich compound 15 M 800 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

⁴ Goodrich compound 15 JM 581 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

lint-free cloth saturated with alcohol or acetone and then quickly placed against a standard hiding power test chart.⁶ The diagonal black contrast lines on the chart shall be clearly discernible when viewed through the fluid in the bottle. The fluid shall also be visually examined for evidence of stratification, separation, precipitation, and crystallization.

(b) Cold Test B shall be determined by maintaining two 125 cc oil-sample bottles, each containing 100 cc of the fluid, at -60°F for six hours. At the end of this period one bottle shall be tilted from the vertical to the horizontal position, and the time that flow begins shall be recorded. The second bottle shall be quickly wiped with a clean lint-free cloth saturated with alcohol or acetone and then quickly placed against a standard hiding power test chart.⁶ The diagonal black contrast lines on the chart shall be clearly discernible when viewed through the fluid in the bottle. The fluid shall also be visually examined for evidence of stratification, separation, precipitation, and crystallization.

8.3 Boiling Point—The apparatus required (Fig. 1) consists of a 100-cc round-bottom shortneck flask having a 19/38 female ground-glass joint, and a 10-mm OD side-entering tube, a 500-F thermometer accurately calibrated for 3-in. immersion, and a straight-tube 200-mm jacket-length Liebig condenser, equipped with a 19/38 drip-tip male ground-glass joint at its lower end. Also three or four pieces of unglazed porcelain, each about 4 mm in diameter, are required. These are made by breaking up a porous plate made of unglazed porcelain, their function being to prevent superheating during the test.

A 60-cc sample of the fluid together with three or four pieces of porous plate shall be placed in the flask, the condenser attached, and the thermometer inserted through the side tube to within $\frac{1}{4}$ in. of the bottom center of the flask. A seal shall be made around the thermometer with a short piece of rubber tubing. The flask shall be mounted on an asbestos-centered wire gauze and the whole assembly held in place by a clamp. The condenser water is turned on and heat applied by a bunsen burner or electric heater at such a rate that the fluid is brought to its boiling point in 10 min. The rate of reflux is then adjusted over another 10-min period to approximately 1 drop of reflux per sec. The temperature is then read, and after being corrected for barometric pressure according to ASTM D 86, it is taken as the boiling point.

8.4 Flash Point—The flash point of the fluid shall be determined by the Cleveland open-cup method.

8.5 Evaporation

Percentage—Evaporation of the fluid shall be determined by placing a 10-cc sample in a clean, dry, weighed, covered Petri dish of approximately 100 mm in diameter and 15 mm high and weighed with cover in place to the closest 0.01 g. The Petri dish and fluid shall then be placed on the inverted Petri-dish cover in a $210 \pm 5^{\circ}\text{F}$ air bath, free from drafts, for 48 hr. After this time, the Petri dish and cover shall be

⁶ The standard hiding power test chart must be used to assure uniformity of testing. A suitable hiding power chart is described in ASTM D 344-39 and D 406-39.

removed from the air bath, allowed to cool in a desiccator, and reweighed to determine the weight of fluid remaining.

The per cent evaporation shall be calculated as follows:

$$\text{Per cent evaporation} = \frac{W - R}{W} \times 100$$

where

R = weight of residue after heating

W = initial weight of sample

Quality of Residue—The residue remaining after the test outlined in section 8.5 (percentage) shall be examined for liquidity and for the amount and nature of the precipitate. The residue shall then be held at a temperature of 32 ± 2 F for 2 hr and then examined for liquidity.

8.6 Water Tolerance—Two 100-cc samples of fluid shall each be mixed with $3\frac{1}{2}$ cc of distilled water. One sample shall be maintained at a temperature of 140 F and the other at -40 F for a period of 24 hr each, and both shall be examined for stratification and precipitation. At the end of 24 hr, the -40 F sample bottle is to be tilted from a vertical to a horizontal position, and the fluid shall begin to flow within 5 sec.

8.7 Neutrality—The pH shall be determined by the electrometric method. To the fluid is added 5% (by volume) of distilled water and 100% (by volume) of an 80% ethyl alcohol, 20% water mix, which mix shall have been adjusted to 7.0 pH. The pH is to be taken at a fluid mixture temperature of 75 ± 15 F.

Alternative Neutrality Method—If the fluid is miscible with an equal volume of water, then water may be used in place of the above alcohol-water mixture.

8.8 Corrosion—The corrosion test shall be carried out as follows:

The test strips², each of 20-35 sq cm area (approximately $3\frac{1}{2} \times \frac{1}{2}$ in.), shall, with the exception of the tinned-iron strips, be cleaned by abrading them with 320A waterproof carborundum paper and stoddard solvent, or equivalent, until all surface scratches, cuts, and pits are removed from the strips. A new piece of paper is to be used for each different type of metal. They shall then be given a medium high polish by means of 00 steel wool and alcohol, then washed in alcohol, then dried with a stream of dry air, and then placed in a desiccator at room temperature until equilibrium is attained. Strips shall be handled with clean forceps after polishing to avoid fingertip contamination.

The strips shall be weighed to nearest 0.1 mg. The weighed strips, arranged in the order of tinned iron, steel, aluminum, cast iron, brass, and copper, shall be joined in metal-to-metal contact by fastening with a steel bolt or cotter pin passed through holes drilled near one end of each strip. The strips shall be so bent that, except for the small terminal area near the bolt or cotter pin, the strips shall not be in direct contact one with another. Strips should be immersed in alcohol to eliminate fingerprints and then handled with forceps. The strips shall then be

² Test strips may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

inserted into a 1-pt Mason jar in such manner that the bolted ends shall rest within the concavity of a new natural rubber cup². The 350 cc of the fluid to be tested, diluted with 5% (by volume) of distilled water and heated to approximately 200 F, shall then be poured into the test jar to submerge totally the test strip assembly. The glass cover shall then be clamped on in a vapor tight manner with the aid of a conventional Mason-jar rubber gasket and the test vessel held for 120 hr in an oven at 210 ± 5 F. At the end of the test period the strips are to be removed, the adhering fluid flushed off with water, the individual strips disengaged one from the other and cleaned to remove any adhering corrosion products.

The strips shall first be washed with a cloth wet with a 1:1:1 mixture of alcohol, acetone, and benzol to remove varnish, lacquer, and similar coatings. Coarse abrasives such as wire brushes or steel wool shall not be used for cleaning following the corrosion test, but a mild nonabrasive soap or solvent is permitted. Cleaning is completed by rinsing in water, then in alcohol, drying with a jet of air, and bringing to equilibrium in the desiccator. The cleaned strips shall then be weighed to nearest 0.1 mg. Corrosion loss is determined by dividing the difference in weight of each specimen before and after the test by the total exposed surface area of the specimen as measured in square centimeters.

The average of three tests shall be the corrosion loss.

8.9 Boiling Point Change—A 60-cc sample of fluid is placed in boiling point equipment, as described in section 8.3, and held at 370 F for 2 hr. After being held at 370 F for 2 hr, the boiling point shall not be less than 370 F.

8.10 Rubber Swelling—Absorption of liquid by rubber cups and washers used in the hydraulic brake systems shall be tested as follows:

Natural Rubber Swelling

Cups—The cups used shall be $1\frac{1}{4}$ -in. natural rubber cups³ and should not be more than nine months old from date of production. Cups shall be free of lint and dirt, the base diameter determined to the nearest thousandth of an inch with a micrometer, and the diameter recorded. In measuring base diameter of a cup, care shall be taken that the micrometer does not extend more than $\frac{1}{32}$ in. beyond the bottom edge of the cup. The diameter shall be taken as an average of two readings at right angles to each other. If these two diameters differ more than 0.003 in., the cup shall be discarded.

Procedure—Two cups, whose base diameters have been measured, shall be immersed in 75 cc of the fluid under test, in an 8-oz screw-cap glass bottle and held at a temperature of 158 ± 2 F for a period of 120 hr. After 120-hr exposure, the cups shall be removed from the bottle, washed quickly with alcohol, dried with a clean cloth, and measured across the base with a micrometer as before. This measurement shall be within 10 min after taking the cup out of the fluid. The surface of the cups shall be visually examined.

Standard SBR Rubber Swelling

Cups—The cups used shall be $1\frac{1}{8}$ -in. standard SBR cups⁴ and should not be more than nine months old from date of production. Cups shall

be free of lint and dirt, the base and lip diameters determined to the nearest thousandth of an inch with a micrometer, shadowgraph, or other suitable apparatus, and the diameters recorded. In measuring base diameter of a cup, care shall be taken that the micrometer does not extend more than $\frac{1}{32}$ in. beyond the bottom edge of the cup. The diameter shall be taken as an average of two readings at right angles to each other. If these two diameters differ more than 0.003 in., the cup shall be discarded.

Procedure—Two cups, whose base and lip diameters have been measured, shall be immersed in 75 cc of the fluid under test, in an 8-oz screw-cap glass bottle and held at a temperature of 250 ± 5 F for 70 hr. After 70-hr exposure, the cups shall be removed from the bottle, washed quickly with alcohol, dried with a clean cloth, and measured across the base with a micrometer, shadowgraph, or other suitable apparatus. This measurement shall be within 10 min after taking the cup out of the fluid. The surface of the cups shall be visually examined.

Precipitation Characteristics—Two $1\frac{1}{8}$ -in. standard SBR cups shall be placed in a tightly sealed 8-oz screw-cap glass bottle, together with 75 cc of the fluid under test and held at a temperature of 250 ± 5 F for 70 hr. After removal from the oven, the cups shall remain in the fluid at room temperature for 24 hr, and the resultant precipitate classified¹ as none, trace, light, medium, or heavy. It is recommended that a blank be run on the fluid with each series of tests.

8.11 Compatibility—Prepare a mixture consisting of 50 parts, by volume, of the brake fluid under test, and 50 parts, by volume, of the Standard Compatibility Test Brake Fluid.⁵ One hundred cubic centimeter of this fluid mixture shall be placed in each of two 125 cc oil sample bottles. One bottle shall be held for 24 hr at 140 F and the other for 24 hr at -40 F. The bottle which has been maintained at -40 F shall be quickly wiped with a clean lint-free cloth saturated with alcohol or acetone and then quickly placed against a standard hiding power test chart.⁶ The diagonal black contrast lines on the chart shall be clearly discernible when viewed through the fluid-mixture in the bottle. Both test mixtures shall be visually examined for evidence of stratification, separation, precipitation, and crystallization.

8.12 Lubrication—The following test procedures are intended for use in evaluating the lubricating quality of the brake fluid. Two procedures shall be used: (A) to determine the effect on natural rubber cups, and (B) to determine the effect of the fluid at higher temperatures with standard SBR cups where high temperature resistance rubber is more suitable.

⁵ The Standard Compatibility Test Brake Fluid is a composite mixture of representative brake fluids meeting SAE 70R used in new car production. Standard Compatibility Test Brake Fluid may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y. Use of this fluid or its equivalent promotes uniformity of test results.

⁶ The standard hiding power test chart must be used to assure uniformity of testing. A suitable hiding power test chart is described in ASTM D 344-39 and D 406-39.

Test Procedure A—150,000 strokes at 158 ± 5 F and 500 ± 50 psi with natural rubber cups³.

Test Procedure B—70,000 strokes at 250 ± 5 F and 1000 ± 50 psi with standard SBR rubber cups⁴.

8.12.1 A typical apparatus consists of:

(a) One hydraulic brake system master cylinder of $1\frac{1}{8}$ -in. diameter.

(b) Four brake assemblies having $1\frac{1}{8}$ or $1\frac{1}{4}$ -in. diameter wheel cylinders, together with brake drums.

(c) A pressure relief or safety valve:

Test Procedure A—Set for operation at a pressure of 500 ± 50 psi.

Test Procedure B—Set for operation at a pressure of 1000 ± 50 psi.

(d) A pressure gage:

Test Procedure A—Satisfactory for operation at a pressure of 500 ± 50 psi.

Test Procedure B—Satisfactory for operation at a pressure of 1000 ± 50 psi.

NOTE: A diagrammatic sketch of a suitable form of apparatus is shown in Fig. 2. Additional information on suitable stroking equipment may be found in Fig. 6 of SAE Standard, Rubber Cups for Hydraulic Actuating Cylinders (SAE 60R).

8.12.2 The master- and wheel-cylinder castings shall be of cast iron, and the pistons shall be of an unanodized aluminum alloy.

8.12.3 Fifteen feet of $\frac{1}{4}$ -in. OD copper tubing shall be used in assembling the apparatus.

8.12.4 The apparatus shall be enclosed in a heated air bath, controlled to a specified temperature in the fluid in the master cylinder reservoir.

Test Procedure A— 158 ± 5 F.

Test Procedure B— 250 ± 5 F.

NOTE: When strip heaters are used, they shall be placed 6 or more in. from cylinders on test.

8.12.5 Mechanical application of pressure to the master push-rod shall be employed to simulate operation on the vehicle as closely as possible.

8.12.6 Rubber parts for Procedure A will meet SAE 60R1.

8.12.6 Rubber parts for test Procedure A will meet SAE 60R1.

Rubber parts for test Procedure B will meet SAE 60R2.

NOTE: New master- and wheel-cylinder units shall be purchased unassembled and must not be used for more than one test. No parts shall be used in any test unless these are in satisfactory condition on inspection prior to assembly of the apparatus. New rubber cups which shall not be more than nine months old from date of manufacture must be employed for each test.

³ Goodrich compound 15 M 800 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

⁴ Goodrich compound 15 JM 581 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

8.12.7 Test Procedures—The test procedures to be employed are as follows:

(a) The rubber and metal parts shall be washed or flushed with alcohol, dried, and inspected for corrosion or other defects.

(b) The fluid lines shall be cleaned and flushed with alcohol and blown dry with dry air.

(c) Immediately after inspection, the test parts shall be dipped into and coated with the fluid to be tested, the apparatus assembled, and the test conducted promptly.

(d) The test fluid shall then be introduced into the apparatus and the system bled free of air.

(e) The stroke of the master-cylinder push-rod shall be adjusted to be as nearly as possible along the centerline of the cylinder, to avoid side thrust and excessive wear.

(f) At the start of the test, the brake shoes shall be adjusted concentric with the brake assembly axis to provide a diametral clearance of 0.080 in. between the shoes and the drums (0.040 in. clearance on each side).

(g) Stroke shall be adjusted to give a specified maximum pressure as measured by a pressure gage installed in the fluid line.

Test Procedure A— 500 ± 50 psi.

Test Procedure B— 1000 ± 50 psi.

(h) Stroking shall be at the rate of 1000 ± 100 strokes per hr, and the tests shall be continued for the specified time.

Test Procedure A—Total of 150,000 strokes.

Test Procedure B—Total of 70,000 strokes.

(i) At the end of the test, the condition of the parts as disassembled shall be noted, following which the parts shall be washed with alcohol and further inspected immediately.

(j) If mechanical difficulties which cannot be attributed to the fluid are encountered during the test, the test shall be repeated.

8.13 Residue and Corrosion—A complete brake wheel cylinder assembly ($1\frac{1}{8}$ to $1\frac{1}{4}$ in. in diameter), except boots, having an iron housing and aluminum pistons shall be used for the test. It shall be carefully cleaned to remove all traces of residual brake fluid or rust preventive oil. After cleaning, the parts shall be rinsed with alcohol and dried. All parts shall then be assembled using a wire or clamp to hold the pistons approximately $\frac{1}{4}$ in. inside the cylinder. While assembling, each part shall be dipped into the brake fluid under test. After assembly, 5 ml of the brake fluid under test shall be added to the assembly through the inlet connection. The bleeder opening shall be tightly closed. With the inlet connection fitting removed, the assembly shall be placed in an oven with the bleeder connection in an upward position. The assembly shall be kept in the oven at temperature of 158 ± 5 for 14 days. After the 14 days, the assembly shall be carefully disassembled to observe conformance with the requirements specified in section 7.6.

CENTRAL SYSTEM FLUIDS (SAE 71R)

SAE Recommended Practice

Report of Fuels and Lubricants Technical Committee and Nonmetallic Materials

Committee approved June 1960.

General Information—Specifications for a central system fluid, both petroleum base and synthetic, are given to permit the development and use of central hydraulic systems in highway vehicles. Fluids meeting these specifications are suitable for use over a wide range of applications in that they combine many of the characteristics of both power steering and brake fluids. Because of the power steering requirements, the central system fluid has many of the characteristics needed in an automatic transmission fluid; it is, therefore, possible that the fluid may be used in the development of automatic transmissions. This versatility is necessary for a central system fluid. A central system may use the same fluid for actuating power steering, starting motor, hydro-pneumatic suspension, brakes, seat actuators, windshield wipers and window regulators.

Scope—The specifications cover fluids designed to operate in the circulating system from -40°F through 275°F . Because of the relatively recent availability of these fluids, their requirements are based not only on limited direct experience but also on a combination of the established specifications for fluids used in power steering and brake systems.

It will be noted that compatibility between the petroleum (SAE 71R1) and synthetic (SAE 71R2) is not required since mixing the fluids is not foreseen. IN ADDITION, IT SHOULD BE EMPHASIZED THAT DIFFERENT TYPE BRAKE SEALS ARE REQUIRED; SBR FOR SYNTHETIC, AND NITRILE RUBBER FOR PETROLEUM.

PETROLEUM BASE CENTRAL SYSTEM FLUIDS (SAE 71R1)

TABLE 1—SPECIFICATIONS FOR PETROLEUM BASE CENTRAL SYSTEM FLUIDS (SAE 71R1)

The latest ASTM test method shall be used unless otherwise noted.

Tests	Test Limits
VISCOSITY— KINEMATIC	2000 cs max at -40°F (before and after shear), 5.5 cs min at 210°F (after shear). The -40°F viscosity of the fluid shall be determined by actual test (not extrapolation) using Low Temperature (-40°F) Viscosity—Brookfield Procedure ^a . The 210°F viscosity of the fluid shall be determined by procedure outlined by ASTM D 445.
SHEAR TEST	The shear stability of the fluid shall be determined by Shear Test for Fluids—Pump ^a . 225 F min.
FLASH POINT	The flash point shall be determined by the ASTM D 92 method.

TABLE 1—SPECIFICATIONS FOR PETROLEUM BASE CENTRAL SYSTEM FLUIDS

(SAE 71R1) .—Continued.

The latest ASTM test method shall be used unless otherwise noted.

Tests	Test Limits																
INITIAL BOILING POINT	400 F min. The initial boiling point shall be determined by ASTM D 158 Method.																
COLD TEST (a)	—50 F min (6 days at —50 F). The cold test (a) shall be determined by SAE 70R3 brake fluid test 8.2 ^b .																
COLD TEST (b)	—70 F min (6 hours at —70 F). The cold test (b) shall be determined by SAE 70R3 brake test 8.2 ^b .																
FOAMING	100 ml foam volume max at end of 5-minute blowing period. No foam at end of 4-minute settling period. The foam tests shall be determined by ASTM D 892 method except that the settling period shall be 4 minutes instead of 10 minutes.																
ANTI-WEAR	Pump delivery at 700 rpm and 600 psi discharge shall not decrease more than 0.2 gpm during 100 hr as indicated by measurements on Standard Reference Fluid at start and end of test as determined by Wear and Pump Delivery Test ^a . Pump parts, by visual inspection, shall show no signs of excessive wear. Parts should be burnished and show no signs of galling.																
OXIDATION STABILITY	Rating 80 min. The oxidation stability shall be determined by Oxidation Test—Automatic Transmission ^a .																
CORROSION RESISTANCE	No visible rust. The corrosion resistance shall be determined by ASTM D 665 turbine oil test with a steel test specimen using procedure "A" for distilled water.																
SEAL COMPATIBILITY (Rubber Swelling)	The increase in the base diameter of nitrile rubber cups after 70 hr exposure to the fluid at 250 ±5 F shall not be less than 0.005 in. nor more than 0.055 in. The surface shall not be tacky or show any sloughing as may be indicated by carbon black on the surface. This test shall be similar to SAE 70R3 brake fluid test 7.3.2 ^b .																
(Lubrication)	Pass SAE 70R3 brake fluid test 7.5 ^b . This test shall be determined by SAE 70R3 brake fluid test procedure "B", section 8.12 ^b except that nitrile rubber cups shall be used both in wheel cylinders and master cylinder. Steel tubing 3/16 in. dia shall be substituted for copper tubing and steel fittings used.																
	<table> <tr> <th>Part</th><th>Test Procedure B Part Number^c</th></tr> <tr> <td>Wheel Cylinder</td><td>NXA-18210</td></tr> <tr> <td>Master Cylinder</td><td>NXA-18209</td></tr> <tr> <td>Primary Cup</td><td>NXA-18212</td></tr> <tr> <td>Secondary Cup</td><td>NXA-18213</td></tr> <tr> <td>Residual Check Valve Seat</td><td>NXA-18214</td></tr> <tr> <td>Residual Check Valve Seal</td><td>NXA-18215</td></tr> <tr> <td>Wheel Cylinder Cups</td><td>NXA-18211</td></tr> </table>	Part	Test Procedure B Part Number ^c	Wheel Cylinder	NXA-18210	Master Cylinder	NXA-18209	Primary Cup	NXA-18212	Secondary Cup	NXA-18213	Residual Check Valve Seat	NXA-18214	Residual Check Valve Seal	NXA-18215	Wheel Cylinder Cups	NXA-18211
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Wheel Cylinder	NXA-18210																
Master Cylinder	NXA-18209																
Primary Cup	NXA-18212																
Secondary Cup	NXA-18213																
Residual Check Valve Seat	NXA-18214																
Residual Check Valve Seal	NXA-18215																
Wheel Cylinder Cups	NXA-18211																
WATER TOLERANCE	Water tolerance is not practical for petroleum base fluids. Provision must be made in the system for the elimination of water or prevention of its entrance.																
COMPATIBILITY	No liquid stratification or precipitation shall be evident. The test shall be the same as SAE 70R3 brake fluid test 8.11 ^b . Only petroleum base central system fluids meeting all other SAE 71R1 specifications are to be used. Compatibility between petroleum base and synthetic fluids is not required.																

^a See SAE Recommended Practice, Tests for Central System Fluids.^b See SAE Standard, Hydraulic Brake Fluid (SAE 70R).^c These parts or exact equivalent should be used. The test parts can be ordered from Bendix Products Division, Automotive Sales Dept., 401 Bendix Drive, South Bend, Indiana.

SYNTHETIC CENTRAL SYSTEM FLUIDS (SAE 71R2)

TABLE 2—SPECIFICATIONS FOR SYNTHETIC BASE CENTRAL SYSTEM FLUID (SAE 71R1)

The latest ASTM test method shall be used unless otherwise noted.

Tests	Test Limits														
VISCOSITY— KINEMATIC	<p>1800 cs max at -40 F (before and after shear). 5.5 cs min at 210 F (after shear) for oils containing VI improver; or 4.5 cs at 210 F (after shear) for oils not containing VI improver.</p> <p>The -40 F viscosity of the fluid shall be determined by actual test (not extrapolation) by ASTM D 445 method.</p> <p>The 210 F viscosity of the fluid shall be determined by procedure outlined by ASTM D 445.</p>														
SHEAR TEST	The shear stability of the fluid shall be determined by Shear Test for Fluids—Pump ^a .														
FLASH POINT	<p>205 F min.</p> <p>The flash point shall be determined by the ASTM D 92 method.</p>														
BOILING POINT	400 F min. The boiling point shall be determined by method used for SAE 70R3 brake fluid test 8.3 ^b .														
COLD TEST (a)	-50 F min (6 days at -50 F). The cold test (a) shall be determined by SAE 70R3 brake fluid test 8.2 ^b .														
COLD TEST (b)	-70 F min (6 hours at -70 F). The cold test (b) shall be determined by SAE 70R3 brake test 8.2 ^b .														
FOAMING	100 ml foam value max at end of 5-minute blowing period. No foam at end of 4-minute settling period. The foam tests shall be determined by ASTM D 892 method except that the settling period shall be 4-minutes instead of 10-minutes.														
ANTI-WEAR	<p>Pump delivery at 700 rpm and 600 psi discharge shall not decrease more than 0.2 gpm during 100 hr as indicated by measurements on Standard Reference Fluid at start and end of test as determined by Wear and Pump Delivery Test^a.</p> <p>Pump parts, by visual inspection, shall show no signs of excessive wear. Parts should be burnished and show no signs of galling.</p>														
OXIDATION STABILITY	Rating 80 min. The oxidation stability shall be determined by Oxidation Test—Automatic Transmission ^a .														
CORROSION RESISTANCE	<p>The fluid when tested under conditions outlined for SAE 70R3 brake fluid 8.8^b shall not cause corrosion exceeding the following limits:</p> <table> <tr> <th>Test Strip</th><th>Permissible Loss mg per sq cm of surface, max</th></tr> <tr> <td>Tin Coated Iron cut from 1.19 lb per base box min. sheet (Type 1, Grade 1 of Federal Spec. QQ-1-706A)</td><td>0.2</td></tr> <tr> <td>Steel, SAE 1010 (cold-rolled)</td><td>0.2</td></tr> <tr> <td>Aluminum, SAE 24</td><td>0.1</td></tr> <tr> <td>Cast Iron, SAE 111, or strips from housing of wheel brake cylinders (smooth machined surface)</td><td>0.2</td></tr> <tr> <td>Brass, SAE 70A</td><td>0.5</td></tr> <tr> <td>Copper, SAE 71</td><td>0.5</td></tr> </table>	Test Strip	Permissible Loss mg per sq cm of surface, max	Tin Coated Iron cut from 1.19 lb per base box min. sheet (Type 1, Grade 1 of Federal Spec. QQ-1-706A)	0.2	Steel, SAE 1010 (cold-rolled)	0.2	Aluminum, SAE 24	0.1	Cast Iron, SAE 111, or strips from housing of wheel brake cylinders (smooth machined surface)	0.2	Brass, SAE 70A	0.5	Copper, SAE 71	0.5
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Brass, SAE 70A	0.5														
Copper, SAE 71	0.5														
SEAL COMPATIBILITY (Rubber Swelling)	<p>The fluid mixture shall show no gelling at room temperature and shall not contain more than a medium^c precipitate. Discoloration or slight generalized etching of the test strips shall not be cause for rejection of the fluid.</p> <p>The increase in the base diameter of both natural^d and SBR^e rubber cups after 70 hr at 250 ± 5 F exposure to the fluid shall not be less than 0.005 in. nor more than 0.055 in. The surface shall not be tacky or show any sloughing as may be indicated by carbon black on the surface.</p> <p>This test shall be similar to SAE 70R3 brake fluid test 7.3.2.</p>														

TABLE 2—SPECIFICATIONS FOR SYNTHETIC BASE CENTRAL SYSTEM FLUID
(SAE 71R1) .—Continued.

The latest ASTM test method shall be used unless otherwise noted.

Tests	Test Limits										
(Lubrication)	<p>Pass SAE 70R3 brake fluid test 7.5^b. This test shall be determined by SAE 70R3 brake fluid test procedure "B", section 8.12 except that 3/16 in. dia steel tubing shall be substituted for copper tubing and steel fittings used.</p> <table> <tr> <th>Part</th><th>Test Procedure B Part Number</th></tr> <tr> <td>Master Cylinder Primary Cup</td><td>FD-2398-(AA) (Compound W-6730-B)^e</td></tr> <tr> <td>Master Cylinder Secondary Cup</td><td>FD-2399-(AA) (Compound W-6730-B)^e</td></tr> <tr> <td>Compensator Check Valve</td><td>FC-14424</td></tr> <tr> <td>Wheel Cylinder Cups</td><td>1674080-AA (Compound W-6100)^e</td></tr> </table>	Part	Test Procedure B Part Number	Master Cylinder Primary Cup	FD-2398-(AA) (Compound W-6730-B) ^e	Master Cylinder Secondary Cup	FD-2399-(AA) (Compound W-6730-B) ^e	Compensator Check Valve	FC-14424	Wheel Cylinder Cups	1674080-AA (Compound W-6100) ^e
Part	Test Procedure B Part Number										
Master Cylinder Primary Cup	FD-2398-(AA) (Compound W-6730-B) ^e										
Master Cylinder Secondary Cup	FD-2399-(AA) (Compound W-6730-B) ^e										
Compensator Check Valve	FC-14424										
Wheel Cylinder Cups	1674080-AA (Compound W-6100) ^e										
WATER TOLERANCE COMPATIBILITY	<p>Pass SAE brake fluid 70R3 water tolerance test 8.6^b. No liquid stratification or precipitation shall be evident. The test shall be determined by SAE 70R3 brake fluid test 8.11^b. Only synthetic central system fluids meeting all other SAE 70R3 specifications are to be used. Compatibility between synthetic and petroleum base fluids is not required.</p>										

^a See SAE Recommended Practice, Tests for Central System Fluids.

^b See SAE Standard, Hydraulic Brake Fluid (SAE 70R).

^c The following are definitions for types of precipitates:

A trace precipitate shall be flocculent and remain in suspension. A light precipitate shall be flocculent, may settle, but possess no crystalline formations.

A medium precipitate shall be primarily flocculent material with a few small crystals.

A heavy precipitate shall be large in volume and contain both flocculent and crystalline material.

^d Goodrich compound 15 M 800 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.

^e Goodrich compound 15 JM 581 or exact equivalent. This material must be used to assure uniformity of testing and may be procured from Chemical Specialties Manufacturers Association, Inc., 50 East 41 St., New York 17, N. Y.



TESTS FOR CENTRAL SYSTEM FLUIDS

SAE Recommended Practice

Report of Fuels and Lubricants Technical Committee and Nonmetallic Materials

Committee approved June 1960.

SHEAR TEST FOR FLUIDS—PUMP

This shear test is designed principally to determine the shear resistance as measured by viscosity change of central system fluids. (SAE 71R1 Petroleum and SAE 71R2 Synthetic), under conditions simulating end use. See SAE Recommended Practice, Central System Fluids (SAE 71R). Pump output measurements before and after shear are also determined as an additional indication of viscosity loss due to shear.

1. **Purpose**—The SAE 71R1 central system fluids will have very high viscosity indices to meet both the required —40 F and 210 F viscosities. Fluids of this type often decrease in viscosity in use due to mechanical shear caused by their passing through a vane pump or other shearing mechanism used in the system. Because of this possible loss in viscosity due to normal use, the viscosity of the unused fluid is not a reliable criterion of pumping efficiency. If the fluid becomes too "light", impaired power steering assist can result. This will be most noticeable at low vehicle and concomitant pump speeds when adequate boost is most needed, as in a parking maneuver.

This test has been designed to subject the fluid to shear conditions which will reduce the fluid to its permanent end use viscosity. It has been found that the viscosity of a fluid will decrease most during the initial period of use and that the rate of viscosity decrease will diminish to essentially zero with prolonged use. The actual time required to stabilize viscosity will depend on the relative severity of the shear mechanism and the characteristics of the fluid.

2. **Equipment For Shear Test**—Typical test equipment consists of the following or equivalent.

(a) One hydraulic pump,^{1,2} equipped with a one-quart standard reservoir.

(b) A suitable pump drive, such as a 10 hp electric motor with belt connection to drive pump at 3000 rpm.

(c) A thermocouple.

(d) A temperature controller such as West "Gardsman", Model J.A.²

(e) A low pressure control valve.

(f) A 0.150 psi pressure gage.

(g) A cycle timer, such as Eagle Signal Flex-O-pulse 120 sec cycle.²

¹ For petroleum base fluid use Eaton Mfg. Co. power steering pump No. ER-10919-6 with nitrile rubber seals. For synthetic base fluid use Eaton Mfg. Co. power steering pump No. ER-10919-7 seals made of Michigan Precision Molding Compound No. 8008 silicone.

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

- (h) A 0-1000 psi pressure gage to measure pump discharge.
- (i) A high pressure solenoid valve, such as Automatic Switch Co., "Asco" catalog No. 82233,² $\frac{3}{8}$ in. pipe, in. port, oil, 25-1000 psi.
- (j) A relief valve, such as Vickers, Model CT06C10, 500 - 2000 psi.
- (k) A heat exchanger to maintain oil temperature (150-170 F) in reservoir.
- (l) A heat element on the return line to rapidly raise temperature in reservoir up to the (150-170 F) range.
- (m) A cold water solenoid valve, such as Skinner,² $\frac{1}{8}$ in. orifice, 100 psi.
- (n) Necessary steel tubing and connectors to pipe pumping circuit as shown in Fig. 1—Shear, Wear, and Flow Test.

3. **Equipment—Flow Test**—Typical additional equipment for flow test consists of:

- (a) A hand tachometer such as a Hasler,² to determine pump shaft rpm by inserting the rubber driving member into the center hole provided in the pulley-to-shaft retaining cap screw.

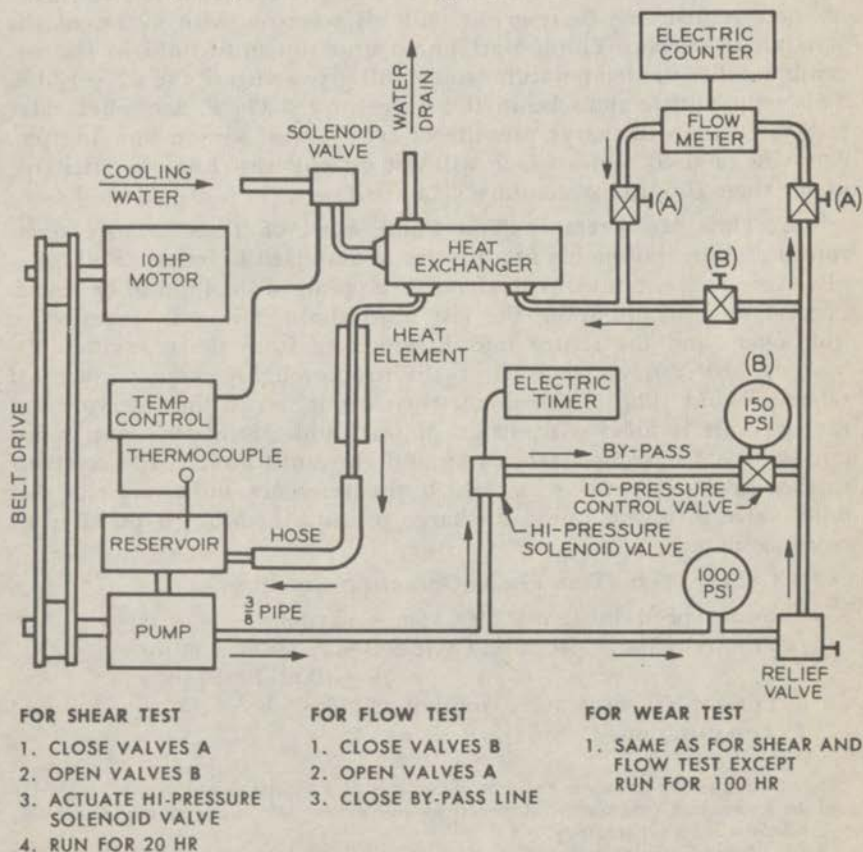


FIG. 1—SHEAR, WEAR, AND FLOW TEST DIAGRAM

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

(b) A turbine-type flow meter, such as the Waugh Model FL6S,² calibrated for 67 SUS oil, together with a Hewlett Packard Model 450-A amplifier,² and Hewlett Packard Model 521-A electronic counter² to determine the pump discharge flow rate.

(c) Three shut-off valves.

(d) Necessary steel tubing and connections to pipe additional pumping circuit as shown in Fig. 1—Shear, Wear, and Flow Test.

4. Test Procedure—If the same equipment is to be used for running tests on petroleum base and synthetic fluids, the system must be THOROUGHLY CLEANED when changing from one base fluid to another.

4.1 Flow Measurement—Reference Fluid—Connect pump output line to flow measurement system as shown in the accompanying diagram. Connect pump drive to give pump speed of 700 ± 5 rpm. Inspect reservoir and clean, if required, and fill with three pints of the Standard Reference Fluid.^{2,3} Flush system by pumping fluid through with relief valve wide open and the return line disconnected from the reservoir.

Connect return line to reservoir and fill reservoir with 40 oz. of the Standard Reference Fluid. Start pump and run until fluid in the reservoir reaches the temperature which will give a viscosity of 67 ± 1 SUS. This temperature shall be in the range of 150-170 F. Set relief valve to give a pump discharge pressure of 600 ± 5 psi. Record flow in gpm. Any new or used pump which will not give at least 1.8 gpm discharge under these conditions should not be used.

4.2 Flow Measurement—Test Fluid—Start of Test—Remove reservoir and clean thoroughly of all traces of Standard Reference Fluid. Replace reservoir and fill it with about three pints of the fluid to be tested. Flush system by pumping the test fluid through it with relief valve wide open, and the return line disconnected from the reservoir. The flushing procedure is repeated again to thoroughly remove traces of reference fluid. The return line is then connected to the reservoir and the reservoir is filled with 40 oz. of test fluid. Maintain pump speed setting at 700 ± 5 rpm. Start pump and run until fluid in the reservoir reaches same temperature at which the reference fluid was run. Set relief valve to give a pump discharge pressure of 600 ± 5 psi. Record flow in gpm.

4.3 Shear Test—Test Fluid—Operating Conditions:

Pump speed constant at $3000 \text{ rpm} \pm 50 \text{ rpm}$

Pump discharge pressure: Cycle 800 ± 20 psi for 1 minute
 75 ± 10 psi for 30 sec

Fluid inlet temperature constant at 170 ± 5 F

Test duration—20 hr

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

³ For testing Petroleum Base Central System Fluids the Standard Reference Fluid is a paraffinic distillate with no additives corresponding to SAE 70R3 in SAE Standard, Hydraulic Brake Fluid (70R) with lubricity comparable to an SAE 10 paraffinic distillate and containing no VI additives. Material meeting these requirements may be obtained from Union Carbide Chemical Co., 270 Park Ave., New York 17, New York.

Connect pump to the circuit as shown on the attached diagrammatic sketch for Shear Test. Check reservoir to make sure no fluid has been lost during the flow test. The timer and temperature controller are now started. The timer holds the bypass solenoid valve open for 30 sec, then closes it for 1 minute. The temperature controller reads the temperature in the reservoir, via thermocouple, and controls the flow of cooling water through the heat exchanger by actuating a solenoid valve in the water inlet line.

The pump may now be started. The relief valve may need readjustment during warm-up, to maintain 800 psi. When the operating temperature of 170 F (reservoir) is reached, system pressure should drop to 70-80 psi when the bypass valve is open. If the pressure is less than 70 psi or greater than 80 psi, the low pressure control valve should be adjusted. Run as follows:

- (a) Retain one pint of unused test fluid.
- (b) Take one ounce samples at 5 hr, 10 hr, and 20 hr for viscosity tests.
- (c) Stop test at 20 hr.
- (d) Retain the used fluid.

4.4 Flow Measurement—Test Fluid—End of Test—After completion of the 20-hr shear test, change pulleys to give pump speed of 700 ± 5 rpm. Close shut-off valves from the shear test system and open shut-off valves to flow measurement system. Using the test fluid from preceding 20-hr shear test, run pump until fluid in reservoir reaches the same temperature which was used for flow measurement at the start of the test. Set relief valve to give a pump discharge pressure of 600 ± 5 psi and record the flow in gpm.

4.5 Flow Measurement—Reference Fluid—End of Test—Drain test fluid from system and retain the used fluid. Remove reservoir and clean. Replace and fill reservoir with about 3 pt of unused Standard Reference fluid. This fluid is pumped through the system and is discarded as it comes out the return line disconnected from the reservoir. Repeat to insure thorough flushing. The return line is connected to the reservoir and the reservoir filled with 40 oz of unused reference fluid. Run pump at 700 ± 5 rpm until fluid in reservoir reaches a temperature which will give a viscosity of 67 ± 1 SUS. This temperature shall be in the range of 150-170 F. Set relief valve to give a pump discharge pressure of 600 ± 5 psi. Record flow in gpm.

5. Viscosity Loss Due To Shear—This is indicated by the 210 F viscosity (measured in centistokes) of successive samples. The 210 F viscosity of 20-hr sample shall not be below the specified minimum. A curve illustrating the shear loss can be made by plotting the viscosity of the new, 5-, 10-, and 20-hr samples versus their respective times. Viscosity is determined by ASTM D 445-53T procedure.

WEAR AND FLOW TEST

This wear test may be run concurrently with the Shear Test—Pump for central system fluids. It is intended to determine the effect of central system fluids (SAE 71R1 Petroleum and SAE 71R2 Synthetic) on pump wear as indicated by hydraulic efficiency under conditions simulating end use. See SAE Recommended Practice, Central System Fluids (71R).

1. **Purpose**—The SAE 71R1 and 71R2 Central System Fluids are intended for use in power steering components and in pumps similar to those used for power steering. These fluids should have sufficient lubricity to insure satisfactory pump life. In a power steering system, the most demanding conditions are those encountered at low engine speed when good pump delivery at high pressure is required to give designed assist during a parking maneuver. If the pump is worn, its low speed hydraulic efficiency will result in inadequate delivery. This test is designed to indicate if the test fluid will lubricate the pump properly, thus maintaining hydraulic efficiency for the expected life of the pump.

2. **Equipment For Wear and Flow Test**—Typical test equipment consists of the following or equivalent:

- (a) One hydraulic pump,^{1,2} equipped with a 1-qt standard reservoir.
- (b) A suitable pump drive, such as a 10 hp electric motor with belt connection to drive at 3000 ± 50 rpm.
- (c) A thermocouple.
- (d) A temperature controller, such as West "Gardsman", Model JA.²
- (e) A low pressure control valve.
- (f) A 0-150 psi pressure gage.
- (g) A cycle timer, such as Eagle Signal Flex-o-pulse,² 120 sec cycle.
- (h) A 0-1000 psi pressure gage to measure pump discharge.
- (i) A high pressure solenoid valve, such as Automatic Switch Co., "ASCO" Catalog No. 82233,² $\frac{3}{8}$ in. pipe, $\frac{1}{2}$ in. port, oil, 25-1000 psi.
- (j) A relief valve, such as Vickers, Model CTO6C10,² 500 to 2000 psi.
- (k) A heat exchanger to maintain temperature in reservoir.
- (l) A heat element on the return line to rapidly raise the temperature in the reservoir up to the (150-170 F) range.
- (m) A cold water solenoid valve, such as Skinner, $\frac{1}{8}$ in. orifice,² 100 psi.
- (n) Necessary steel tubing and connectors to pipe pumping circuit as shown in Fig. 1—Shear, Wear, and Flow test.

3. **Equipment—Flow Test**—Typical additional equipment for flow test consists of:

- (a) A hand tachometer such as a Hasler, to determine pump shaft rpm by inserting the rubber driving member into the center hole provided in the pulley-to-shaft retaining cap screw.
- (b) A turbine-type flow meter, such as the WAUGH Model FL6S,² calibrated for 67 SUS oil, together with a Hewlett Packard Model 450-A amplifier,² and Hewlett Packard Model 521-A electronic counter² to determine the pump discharge flow rate.
- (c) Three shut-off valves.
- (d) Necessary steel tubing and connections to pipe additional pumping circuit as shown on the diagrammatic sketch—shear, wear, and flow test.

¹ For petroleum base fluid use Eaton Mfg. Co. power steering pump No. ER-10919-6 with nitrile rubber seals. For synthetic base fluid use Eaton Mfg. Co. power steering pump No. ER-10919-7 seals made of Michigan Precision Molding Compound No. 8008 silicone.

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

4. Test Procedure—If the same equipment is to be used for running test on petroleum base and synthetic fluids, the system must be THOROUGHLY cleaned when changing from one base fluid to another.

4.1 Flow Measurement—Reference Fluid—A new pump is used for each wear test. Inspect reservoir and clean if required but do not disassemble. Mount pump on test stand and connect the output line to the flow measurement system as shown in the accompanying diagram. Then connect pump drive to give a pump speed of 700 ± 5 rpm. Fill reservoir with about three pints of Standard Reference Fluid.^{2, 3} Flush system by pumping this fluid through it with the relief valve wide open and the return line disconnected from the reservoir. The return line is then connected to the reservoir and the reservoir filled with 40 oz of Standard Reference Fluid.

Start pump and run until fluid in the reservoir reaches the temperature which will give a viscosity of 67 ± 1 SUS. This temperature shall be in the range of 150-170 F.

Set relief valve to give a pump discharge pressure of 600 ± 5 psi. Record flow in gpm. Any new pump which will not give at least 1.8 gpm discharge under these conditions should not be used.

4.2 Flow Measurement—Test Fluid—Start of Test—Remove reservoir and clean thoroughly of all traces of Reference Fluid. Replace reservoir and fill it with about three pints of test fluid.

Flush system by pumping the test fluid through it with relief valve wide open and the return line disconnected from the reservoir. The flushing procedure is repeated again to thoroughly remove traces of Reference Fluid. The return line is then connected to the reservoir and the reservoir filled with 40 oz of test fluid. Maintain pump speed setting at 700 ± 5 rpm. Start pump and run until fluid in the reservoir reaches same temperature at which the reference fluid was run. Set relief valve to give a pump discharge pressure of 600 ± 5 psi. Record flow in gpm.

4.3 Wear Test—Test Fluid—Operating Conditions:

Pump speed constant at 3000 rpm ± 50 rpm

Pump discharge pressure: Cycle 800 ± 20 psi for 1 minute

75 ± 10 psi for 30 sec

Fluid inlet temperature constant at 170 ± 5 F

Test duration—100 hr

This test may be run concurrently with Shear Test for Fluids. The two tests are run under similar conditions except for time and in the Wear Test samples for viscosity measurements are not required. The Wear Test equipment is the same as used in Shear Test for Fluids (see Fig. 1—Shear, Wear, and Flow Test). The Wear Test can be run with the test fluid used in measuring the flow in section 4.2.

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

³ For testing Petroleum Base Central System Fluids the Standard Reference Fluid is a paraffinic distillate with no additives corresponding to SAE 70R3 in SAE Standard, Hydraulic Brake Fluid (70R) with lubricity comparable to an SAE 10 paraffinic distillate and containing no VI additives. Material meeting these requirements may be obtained from Union Carbide Chemical Co., 270 Park Ave., New York 17, New York.

Change pulleys to obtain 3000 ± 50 rpm pump speed.

The timer and temperature controller are now started. The timer holds the bypass solenoid valve open for 30 sec, then closes it for 1 minute. The temperature controller reads the temperature in the reservoir, via thermocouple, and controls the flow of cooling water through the heat exchanger by actuating a solenoid valve in the water inlet line. The pump may now be started. The relief valve may need readjustment during the warm-up to maintain 800 psi. When the operating temperature of 170 ± 5 F (reservoir) is reached, system pressure should drop to 70-80 psi when the bypass valve is open. If the pressure is less than 70 psi or greater than 80 psi, the low pressure control valve should be adjusted.

4.4 Flow Measurement—Test Fluid—End of Test—After completion of the 100-hr Wear Test, change pulleys to give pump speed of 700 ± 5 rpm. Close shut-off valves from the shear test system and open shut-off valves to flow measurement system. Using the test fluid from preceding 100-hr Wear Test, run pump until fluid in reservoir reaches the same temperature which was used for a flow measurement at the start of the test.

Set relief valve to give a pump discharge pressure of 600 ± 5 psi and record the flow in gpm.

5. Flow Measurement—Reference Fluid—End of Test—Drain test fluid from system and retain the used fluid. Remove reservoir and clean. Replace and fill reservoir with about 3 pt of unused Standard Reference Fluid. This fluid is pumped through the system and is discarded as it comes out the return line disconnected from the reservoir. Repeat to insure thorough flushing. The return line is connected to the reservoir and the reservoir filled with 40 oz of unused reference fluid. Run pump at 700 ± 5 rpm until fluid in reservoir reaches a temperature which will give a viscosity of 67 ± 1 SUS. Temperature shall be in the range of 150-170 F. Set relief valve to give a pump discharge pressure of 600 ± 5 psi. Record flow in gpm.

6. Inspection—Drain fluid and remove pump from test stand. The pump is then dismantled, cleaned with a light solvent and visually inspected for evidence of wear. Particular attention should be given to:

- (a) The shaft and its bearings.
- (b) The flat sides of the rotor or carrier.
- (c) The inside periphery of the cam ring.
- (d) The pump body and cover.

OXIDATION TEST—AUTOMATIC TRANSMISSION

This test is designed primarily for the determination of high temperature oxidation stability of central system fluids (SAE 71R1 Petroleum and 71R2 Synthetic), and can be run with the Mercomatic² transmission. See SAE Recommended Practice, Central System Fluids (SAE 71R).

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

1. **Purpose**—Central System Fluids are used primarily to transfer energy or work from the mechanically driven pump to a motor or piston some distance from the source. Modulation or control of the motor is often accomplished by dissipating the excess energy. The fact that this type of control is possible is one of the main advantages of a hydraulic system. The energy dissipated in this manner combined with that lost by normal friction is converted into heat which first heats the fluid and is then transferred to the ambient air by conduction and convection from the hydraulic tubing and/or heat exchanger. Central system fluids, therefore, must tolerate relatively high temperatures, 100 to 150 F above ambient to produce a practical ΔT . In addition, when the fluid is used in a brake system, it will be heated in the wheel brake cylinders by the heat dissipated from the adjacent brake shoes and drums. It is important, therefore, that the central system fluid have a high degree of oxidation stability and that it not produce varnish, gum, sludge or other products of deterioration which will impair the proper functions of the system components.

This test procedure, originally designed to test automatic transmission fluids, has been found to give a reliable indication of the high temperature (275 F) stability of a central system fluid.

2. **Test Equipment—Mercomatic Transmission**—The test equipment consists essentially of the following main items arranged as shown in the diagrammatic sketch:

2.1 **Transmission**—This unit is a 1958 Mercomatic Transmission Assembly No. PBL-7003-M,² and is obtainable from Ford Service. The modification of this transmission consists of:

(a) Replacing its existing coarse-splined input shaft by a fine-splined input shaft, Ford Service Part No. PBM-7015-A,² and

(b) The addition of a small pet-cock to the oil pan facilitate removal of oil samples during test. (See section 3.5—Inspection Procedure).

2.2 **Converter**—In order to facilitate testing and the inspection of the torque converter, the welded converter normally supplied with the above mentioned transmission cannot be used. Instead, a bolted converter should be assembled, using the following Ford Service Parts,^{2,4} and used with the transmission in this test.

2.3 **Electric Motor**—7.5 hp min.

2.4 **Insulating Box**—Made of 1/2 in. plywood and lined with 1 in. Fiberglas insulaton.

2.5 **Blower and Motor Assembly**

a. Blower—Squirrel cage type capable of moving 108 cfm of air at 1760 rpm.

b. Motor—110 v ac, 1760 rpm.

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

⁴ If a synthetic fluid is used in this test, all nitrile rubber seals must be replaced by seals made of Michigan Precision Molding Compound No. 8008 Silicone.

PART NAME	SERVICE PART NO. ²
Flywheel assembly	B5A-6375-A
Cover assembly	B5A-7950-A
Washer, converter thrust	IP-7962-A
O-Ring, converter covers	B6A-7963-A
Turbine assembly, converter	B9AP-7920-A
Stator assembly, converter	B5S-7932-A
Race, converter stator	IP-7947-B
Clutch assembly, converter stator	68A-7940-A
Snap ring, converter stator clutch retainer— 2 required	IP-7945-A
Race, converter stator clutch-inner	IP-7946-A
Washer, converter impeller, thrust	B6A-77909-A
Impeller assembly, converter	B6A-7908-A
Bolts converter cover to impeller 5/16"— 24 x 13/32"—18 required	—
Lock nut, hex. 5/16"—24, impeller to converter cover—18 required	—
Bolts	20310-S
Lock washer	34806-S
Cover assembly, converter housing	MB-7985-A
Housing assembly	B6A-7975-A
Cover	B6A-77979-A
Bolt	20242-S
Lock washer	357625-S

2.6 Temperature Recorder Potentiometer and Blower Controller— Leeds and Northrop "Speedomax H".²

- 2.7 Pressure Gages— (a) Converter Outlet, 0-200 psi
(b) Main line pressure, 0-200 psi
(c) Governor Pressure, 0-200 psi

- 2.8 Thermocouples— (a) Transmission Oil Sump
(b) Converter Outlet

2.9 Multiple-Switch for Thermocouples

3. Test Procedure— Mercomatic Transmission

3.1 Preparation for Test—The test shall be run preferably with a brand new converter-transmission assembly for each fluid tested. The transmission shall be completely disassembled before installation on the test stand, and all parts shall be thoroughly cleaned with petroleum spirits. The transmission shall then be reassembled under conditions of cleanliness and according to manufacturers specifications, but with the stator reversed from its normal position.

A used transmission-converter assembly could be used. It should be disassembled and thoroughly cleaned of all gum, varnish, sludge, and the like, accumulated from previous test. Petroleum spirits and varnish-removing solvent should be used. The transmission should then be rebuilt according to manufacturers specifications with the following replacement parts:

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

PART NAME	FORD SERVICE PART NO. ²
Kit, gaskets and seals	MJK-7153-B
Washer, converter impeller, thrust	B6A-77909-A
Washer, converter, thrust	IP-7962-A
Screen assembly	B7S-77488-A
Front clutch—steel plates	IP-77573-A
Front clutch—bronze plates	B5A-77519-A
Rear clutch—steel plates	IP-77518-A
Rear clutch—bronze plates	B6A-77519-A
Washer, rear clutch sun gear, counterthrust	B5S-77524-A
Washer, rear clutch sun gear, thrust	B5S-77525-A
Washer, front clutch sun gear, thrust	B5S-77545-A
Washer, front clutch sun gear, thrust	B6A-77548-A
Washer, output shaft, thrust	B5A-77067-K or L or M (select fit)
Washer, output shaft, thrust	B5A-77066-A

3.2 Test Set-Up—Equipment should be arranged as shown in the sketch, with the converter housing bolted to a steel support plate which forms a vertical plane. The motor is coupled to the converter shaft. The insulating box should cover the transmission-converter assembly completely. The blower is located so that it can direct air at the area of the converter. The blower is controlled by the transmission oil sump temperature to within ± 2 F via a thermocouple and the temperature controller. Install all gages, thermocouples and wiring as shown in Fig. 2—Oxidation Test.

3.3 Operating Conditions—The equipment shall be operated at 2150 rpm ± 50 rpm and at a temperature of 275 F.

3.4 Test Procedure—(a) Introduce 5-qt of fluid into transmission at start of test run for 5 minutes.

(b) Shut down unit and introduce another 5-qt of fluid.

(c) Shift transmission into drive and install insulating box over equipment.

(d) Start motor and operate at required speed until test temperature of 275 F is reached.

(e) Continue to operate at this speed and temperature until 300 hr are logged. 24-hr per day operation is preferred but 16 hr per day is acceptable as a minimum, provided only test time at 275 F is logged.

3.5 Inspection Procedure—(a) Remove a 2-oz fluid sample, while unit is running, every 50 hr and replace with fresh fluid.

(b) Shut down unit at 100 and 200 hr of logged time for visual inspection of underside of unit.

(c) After completion of test at 300 hr, shut down and disassemble completely transmission and converter for inspection.

(d) Rate the individual components according to CRC Deposit.

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

Rating Scale⁵ for varnish and area-depth method for sludge. 10 represents a perfectly clean part; zero (0) represents a very dirty part.

3.6 Rating Procedure

(a) Record the sludge and varnish ratings in the following manner:

PART NAME	VARNISH	SLUDGE
Converter outer surface	X	
Converter housing, outer		X
Sprag clutches	X	X
Screens, oil	X	X
Steel clutch plates	X	
Valve body—Outer surface	X	
Separator plate	X	
Spools	X	
Cavities	X	X
Clutch pistons		X
Clutch cylinder		X
Sun gear shaft	X	
Oil pan	X	X
Bottom of transmission before disassembly	X	

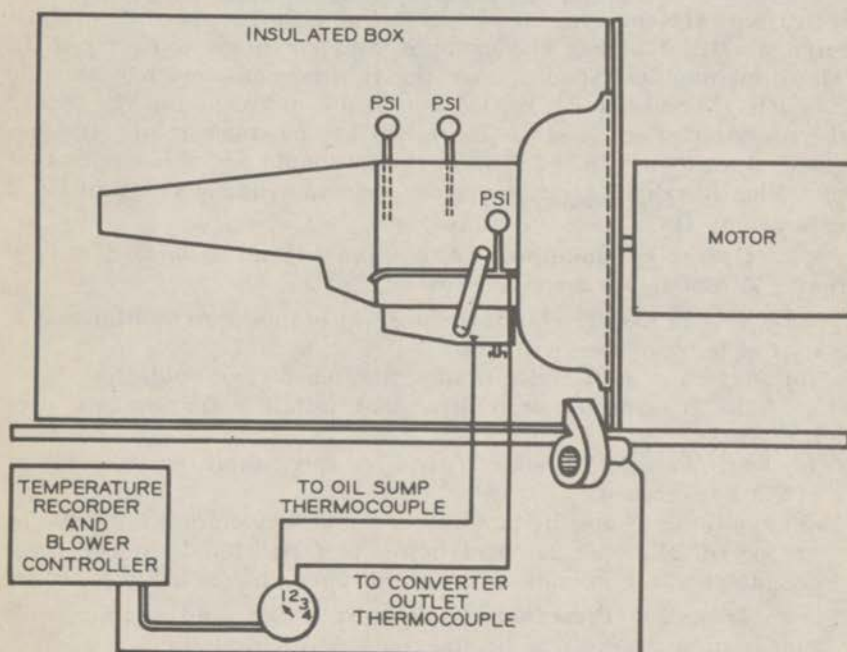


FIG. 2—OXIDATION TEST

(b) Record the condition of the following:

Oil Seals—Cracking, flexibility, and the like

Bronze Washers—Corrosion, wear

Bearings—Corrosion, wear

⁵ The Rating Scale may be obtained from the Coordinating Research Council, Inc., 30 Rockefeller Plaza, New York 20, New York.

- (c) Photograph in color, if possible, as many parts as is practicable.
- (d) Report the properties of used fluid samples as follows:
 - Petroleum ether insolubles—ASTM D 893-52T method
 - Chloroform insolubles —ASTM D 893-52T method
 - Viscosity at 100 F —ASTM D 445-53T method
 - Viscosity at 210 F —ASTM D 445-53T method
 - Acid Number —ASTM D 664-54 method
 - Base Number —ASTM D 664-54 method

4.5 Requirements for Pass—The following items shall be rated and summed for the purpose of determining a pass or failure.

PART NAME	VARNISH	SLUDGE
Converter outer surface	X	
Converter housing, outer		X
Screen	X	X
Steel clutch plates	X	
Valve body—Outer surface	X	
Cavities		X
Clutch pistons		X
Clutch cylinder		X
Bottom of transmission before disassembly	X	
TOTALS	XX	XX

A perfectly clean transmission would rate 50 varnish and 50 sludge for a total of 100.

LOW TEMPERATURE (—40 F) VISCOSITY—BROOKFIELD

This low temperature viscosity method is offered principally to determine the viscosity of new and used petroleum base Central System Fluids. See SAE Recommended Practice, Central System Fluids (SAE 71R)

1. **Purpose**—The SAE 71R1 petroleum base central system fluids have very high viscosity indices to meet both the required —40 F and 210 F viscosities. Generally fluids of this type contain relatively large amounts of VI improvers which may cause the fluid to become non-Newtonian in character, especially at low temperatures. This precludes satisfactory end use correlation with the usual type viscosity measurement (ASTM D 445). This method, which uses a Brookfield viscosimeter, has been found by cold room and actual road tests to give satisfactory indication of the petroleum base fluids ability to operate at low temperatures, down to —40 F.

2. **Apparatus**—Typical apparatus will consist of the following items:

- (a) Brookfield viscosimeter and stand, Model LVF or Model LVT.²
- (b) Spindle, Brookfield viscosimeter No. 4,² with standard guard.
- (c) Cell (test tube) outside diameter 25 mm, length 100 mm.

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

- (d) Cell wood stopper (Fig. 3).
- (e) Insulated cell carrier (Fig. 4).
- (f) Rotating cell rack and base assembly (Fig. 5).
- (g) Cold cabinet with air circulation device. (Ford cold cabinet)²
- (h) Pyrometer potentiometer—Lewis, Model 14PO.²

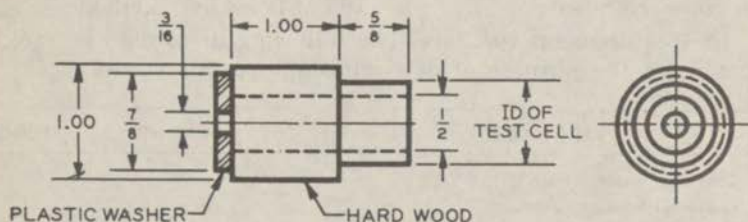


FIG. 3—CELL WOOD STOPPER

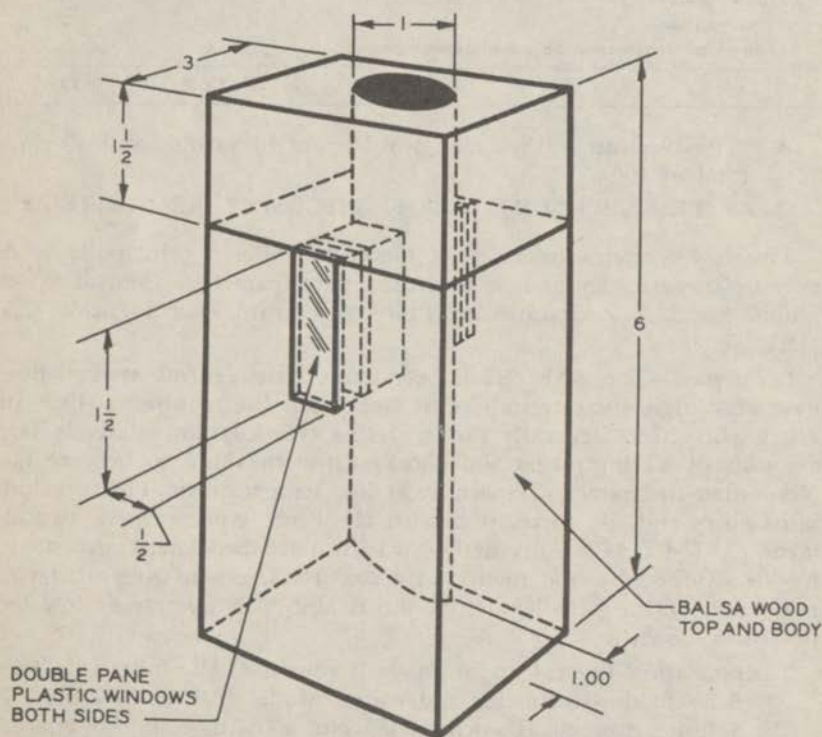


FIG. 4—INSULATED CELL CARRIER

² Certain specific products are referenced in order to insure uniformity in testing and to make the recommended practices more precisely understood. The exact equivalent will be satisfactory.

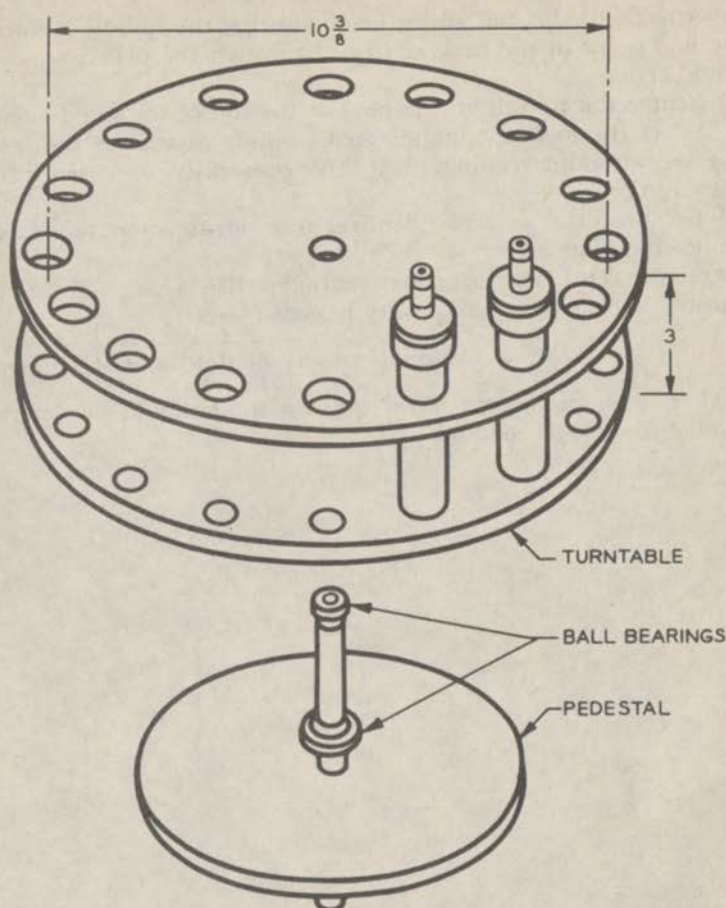


FIG 5—ROTATING CELL RACK AND BASE ASSEMBLY

3. Procedure

- (a) Fill cell with approximately 27 ml of the fluid under test.
- (b) Put stopper on cell and insert spindle.
- (c) Place cell assembly in rack.
- (d) Place rack assembly in oven at 120 F for a half-hour.
- (e) Place rack on base assembly and put these and cell carrier in cold box.
- (f) Establish constant (± 0.5 F) test temperature in cold box.
- (g) Rotate rack at 25 to 35 rpm. (The rack may be rotated by the circulating air in the cold box, but other methods of rack rotation may be used.)
- (h) Allow the cell to remain exposed to the test temperature for a period of 16 hr.
- (i) Place cell in carrier and immediately transfer the unit to the Brookfield viscometer for analysis.

(j) Attach spindle and adjust height so that the spindle is immersed to the mid-point of the neck as viewed through the plastic windows of the cell carrier.

(k) Center the spindle in the hole at the top of the wood stopper.

(l) Select the highest spindle speed possible to analyze the sample.

(m) Repeat taking readings until three consecutive and identical readings are obtained.

(n) Use the value of these identical readings to compute viscosity in the following manner:

Viscosity in centipoises = (scale reading) \times 100-40

Viscosity in centistokes = $\frac{\text{viscosity in centipoises}}{\text{specific gravity of fluid at test temperature}}$

NOTE: The specific gravity of the test fluid should be determined by ASTM D 1298-55 method.

Mr. SCHENCK. I would just like to make this comment: We are glad to have Mr. Richards here, and his associates this morning. I would like to sincerely commend all members of the automobile industry, the Automobile Manufacturers Association, the Society of Automotive Engineers, and all of the associated organizations for their wonderful work and their fine work, and the industry's cooperation by exchanging all sorts of engineering data and testing data on safety devices, and making these safety specifications available to each other. I think that is eloquent testimony of the exercise of responsibility in the field of safety by all branches of the automobile industry and by all professional organizations associated with the automobile industry.

Mr. RICHARDS. Thank you.

Mr. SCHENCK. I believe that you have a very definite feeling of public responsibility in these matters. I think that the industry and everyone connected with it is to be most sincerely commended for their exercising of all of these responsibilities and for their cooperation.

Mr. RICHARDS. Thank you again, Mr. Schenck. We appreciate that.

Mr. ROBERTS. The gentleman from Pennsylvania.

Mr. RHODES. Mr. Chairman, I would like to ask how important the control of the sale and use of brake fluid is to highway safety. To what extent does substandard brake fluid contribute to highway accidents?

Mr. RICHARDS. It would be difficult, probably, to segregate specifically the relative importance. We know that all brake action is very important in safety. We recognize in this specific field that fact.

We have found evidence of accidents resulting from brake failures, and an investigation has indicated that the brake failure was, probably, caused by substandard brake fluid, the use of that substandard brake fluid. We feel it is a very important subject.

Mr. RHODES. Do you have any figures on the number of accidents that have resulted from the substandard brake fluid?

Mr. RICHARDS. Let me ask Mr. Sherman if he has any information. This is one of the weaknesses of our current safety program. We do not have as much physical breakdown as would be desirable.

Mr. SHERMAN. There is not in the accident picture enough investigation of the detail of an accident to answer your question. Very often the presence of a substandard brake fluid, for example, which might result in high temperature buildups and the failure of the fluid to perform and bubbles, so to speak, in the brake fluid line, spongy brake action—these are not particularly evident in accidents. And as you will not from the copy of the SAE standards which have been submitted, the chemical laboratory tests, and the other tests to determine whether the fluid in that automobile was substandard or not, is a very complicated procedure. The most that could be said is that early indications were that as much as 50 percent of the brake fluid on the market was inadequate for the purpose. And this has been reduced in every area where legislation has been adopted by the States. In fact, the benefits go over into adjoining States.

One of the references to the Chemical Specialty Manufacturers Association figures would indicate that at one time as much as 50 percent of the brake fluid was inadequate and now it is, probably, down to 5 percent overall.

So the problem is one you cannot answer in terms of automobile accidents statistics, but you have to look at what is happening in the market in the servicing area.

Mr. RHODES of Pennsylvania. Thank you, that is all.

Mr. ROBERTS. Mr. Rogers.

Mr. ROGERS of Florida. Mr. Richards, I thought your testimony made a very definite contribution. We are all pleased with the industry's action taken on the question of seat belts.

Mr. RICHARDS. Thank you.

Mr. ROGERS of Florida. A great deal needs to be done in the way of education, of course, but certainly, the leadership was taken there and it very well will be helpful, I am sure.

How much would you say has been designated by the industry for safety as such? How much has been spent by them?

Mr. RICHARDS. I would like to have Mr. Isbrandt comment on this subject, because I think this is one that has been commented on before. Safety is such an integral part of our operations that segregating it dollarwise may be a problem, but Mr. Isbrandt has had intimate association with that, and we should let him comment.

Mr. ISBRANDT. Mr. Chairman, and Mr. Rogers, it is difficult for us in the industry to assess either dollars or manpower to the efforts expended in safety. The reason for this being that the entire automobile and all of its components must be analyzed from the safety standpoints. So, consequently, let us take as an example a new front piece suspension system which, in essence, is a means of producing more comfort to the owner of the vehicle. As we go through the design of a new front suspension you might say that there are no areas that pertain immediately to safety that the customer can recognize, but yet we, as an industry, from an engineering standpoint, must evaluate every item of design in detail of that suspension. So, consequently, looking at it from the standpoint of safety alone you would say that the entire suspension group was contributing toward safety.

If you try to assess dollars to that it is very difficult to do.

Mr. ROGERS of Florida. I can understand that.

Mr. ISBRANDT. If you are referring specifically to areas of safety improvements, added features, let us take seat belts as an example—if you are suggesting that. We in the industry, generally—and I am sure this is the case in all of the manufacturer's organizations, which are directly under either the vice president of engineering or a director or engineering, who have a staff assistant, a man who is at the top level of the engineering organization, reporting directly to the director and has the responsibility of overall safety in the vehicle and its design.

He will develop information as the result of our committee activities within the automobile manufacturers associations that will offer areas of improvement or areas of new development. We have in that area now the simple matter, you might say, the matter of attaching the seat belts, as an example.

We have all standardized on the manner in which seat belts will be attached, so that you will be able to buy a package and that package, except for its length, is adjustable, will attach to any one of the automobiles that you might care to purchase, because a means for attachment into the vehicle is identical.

Mr. ROGERS of Florida. Could you give us, say, your budget for research, from the automobile industry standpoint, for safety improvements that directs all of its efforts just to new safety devices and improvements alone? That was the point I was trying to get at.

Mr. ISBRANDT. I would not be able to.

Mr. ROGERS of Florida. Probably, you do not have that information.

Mr. ISBRANDT. I do not have it available. I think that it would be difficult to obtain. We will take the question in hand and see what we can develop.

Mr. ROGERS of Florida. We need the amount they put in a budget, as it applies to a certain research group working on safety improvements alone. Perhaps, you do not have that information. That is what I was thinking of. I have been impressed as to how little we are doing in our governmental departments on research for safety features. I just wanted to have some information on that. I think that we are letting you do all of the work. I wonder if it is not a proper function for some of our effort here to be done on research by the Government along this line, as we are doing in the matter of air pollution.

Mr. RICHARDS. Yes, sir.

Mr. ROGERS of Florida. It has been pointed up that the main cause of death—about 40 percent of the deaths, is due to lack of safety features. If you could supply those figures I think that it would be helpful to give us a proper perspective on that subject.

Mr. RICHARDS. We will try to get you a statement on that. You recognize that this question has come up many times.

Mr. ROGERS of Florida. Yes.

Mr. RICHARDS. I have talked to the chief engineers of practically all of our companies. I might add that their answer in looking at this problem is, "Is not the whole vehicle and all of the research a part of our safety program? Can you point out anything that does not have some bearing on that?"

For example, we asked the Society of Automotive Engineers in 1946 during the Automotive Golden Jubilee to make an exhibit on safety developments. And some people were a little astounded to find the cigarette lighter included and yet that was a very important safety item. Because you did not have to get your two hands off the steering wheel while lighting your cigar or cigarette. And there are such items as windshield wipers and windshield washers, and air conditioning systems, that go into the vehicle. It is difficult to find anything that does not contribute in some degree to safety.

Mr. ROGERS of Florida. I realize that. I think that the committee can understand that.

What we want to know is what the funds are for the specific problem of research for safety improvements.

Mr. RICHARDS. I believe, Mr. Chairman, that it might be well at this point to come back to your comments with respect to H.R. 1341, because this is where our great concern lies in all of these measures, that is, that standards as we have them now in the industry developed along a very definite line and have a definite virtue to be preserved if we are going to continue this process of building better and safer automobiles.

Mr. ROBERTS. I appreciate that fact and I certainly want to commend your industry for coming forward here today and taking this big step forward. I would naturally say that because of my bill, that it is a big step they have taken in the safety field.

I think it is highly commendable that the industry has done this. It gives me a feeling of misgiving to see the governmental departments who are reluctant apparently to move in this field. And it is very refreshing to me to have the automotive industry come in today and say, "We want the Government departments to be able to require minimum standards of safety in cars which they purchase."

I think that statement is very clear. I think it is a great day in this country when private enterprise is taking a big step forward, as the manufacturers have taken in endorsing this legislation.

I am very grateful to you. I am sure that I speak for the subcommittee when I say that we feel deeply obligated to you for taking this forward step. I certainly believe that it speaks for a better day in safety not only throughout these United States, but in other places.

I repeat, we are very grateful to you for taking this step.

Mr. RICHARDS. Thank you.

Mr. ROBERTS. Our next witness is Mr. John O. Moore, who has been connected with the research group at Cornell University. He is one of the best known and best qualified men in this field of highway safety.

I would like to say that Mr. Moore has made a tremendous contribution to the work of this committee. He has always been available to us at very short notice, and glad to do so at his own expense. He has always been a dedicated worker in this field of saving human lives and trying to avoid as much human suffering as possible.

Mr. Moore, we are glad to have you before us today.

STATEMENT OF JOHN O. MOORE, NEW YORK, N.Y.

Mr. MOORE. Mr. Chairman and gentlemen of the committee, it is a great pleasure to be given this opportunity to appear before your committee again and to discuss these problems with which you are concerned and have been concerned with for many years.

I would be forced to address my major comments, if I may, sir, to H.R. 1341, because I think that some of the other bills are merely additives to the overall problem to which you are addressing yourself in your proposed legislation.

There is little room for doubt at this point that accidents per se do produce injury and death.

There is little room for doubt at this point that accidents are the third leading cause of death in the United States of America.

There is little room for controversy that the motor vehicle, which is our means of living, produces an unproportionate amount of death and injury in population groups whom we can least afford to spare.

There is no room for controversy that 42 percent of all of the 13- to 25-year-olds in America who have died in the last 10 years have died inside a motor vehicle.

It is most pleasant for me to have the opportunity, sir, to hear that the industry is willing and in the position of endorsing a concept that we are now in possession of enough known scientific knowledge that

we can begin to write some intelligent standards for protecting and packaging the passenger who must use the motor vehicle in our country as a way of living.

I think anything less than this very blunt description is obfuscating the issue.

People have to move to live. People have accidents because they are human, and we as a society must look for the most intelligent means available to protect those people in our society from the results of this disease.

If we did less than this, we would not be discharging our obligations to our fellow man.

We know that 56 percent of the people we have seen injured in automobile accidents are injured by contact with four components, or the lack of functioning of four components, to protect this passenger during his sudden stoppage.

We are in the position at the moment where we have no standards or criteria for meeting this, in having this knowledge, in any other place other than the Society of Automotive Engineers Committee on Seat Belt Standards.

We do not know at the present time what is the definition of a safety pad. We do not know what is a good definition of a safety door lock, and we do not know what is a good definition of the performance of a steering wheel on contact with the chest during deceleration.

It is my special plea—and I will be as brief as I can—that without the existence of some criteria or standards we are all lost. We do not know what to provide, we do not know what we have to pay for it, or what price penalties we shall assess to the public.

I do not believe that there is the possibility—and I have spent over 20 years of my life in the field of doing research on the concept of packaging the man, both in aircraft and automobiles—I do not sincerely, honestly believe there is any hope that we will acquire these necessary criteria except through action by the Federal Government.

I do not believe that this is a problem which is specialized for the community, the municipality, or the State. I think it is a national problem. And I think it can best be addressed by a national committee, empowered to request that certain agencies of the government arrive with the cooperation of the best informed sources at a set of reasonable criteria which will assure the motoring public that for a price they can be given a guarantee that they are buying a device which will give them a reasonable chance of survival when they do the things which humans are well documented and known to do, to make mistakes.

If I thought that this could be done at the State level, being a southerner by birth and a man dedicated to the concept of State rights, I would plead for it, I would plead for the cause of States to do it.

I have not yet seen any improvement in any criteria or any device which is offered to the public since 1956. And if I multiply the 30,000 lives of occupants of vehicles by sixths, and if I multiply the 4½ million injuries by 6 years, and if I multiply 200,000 permanent disabilities by 6 years, I am compelled to confess that we have delayed too long.

Research is not done by committees. Research is done by agencies designated with this obligation. They need resources. They need funds.

And to my way of thinking, H.R. 1341 will give us the best hope that we have for establishing a reasonable set of criteria.

I have been privileged to be involved in meetings of the American Standards Association, the Society of Automotive Engineers committees, and all of these other agencies, and I would be less than honest if I came before this committee at this time, with the knowledge I have, that you can control deaths and injuries in automobile accidents, and did not plead that we need passage of such a bill, and we do not need it 2 years from now. We have delayed too long already.

I would place before you my credentials as a researcher, a man who has examined in the Cornell program over 45,000 injury-producing accidents, over 100,000 people involved in those accidents, over 400,000 photographs of those accidents, and the record of all of the data in the hands of the industry, on their own particular cars. And I am most excited that the industry has taken such a wonderful forward step today in supporting the facts that we need some place where they can come and the Federal agencies can come and look for guidance and criteria, so that we know what we buy, how much we pay for it, and what we should be reasonably expected to be given in protection against the most common disease which exists in our younger age group in America today.

I would conclude my statement on this point, sir. I realize you are pressed for time and you have a number of other witnesses.

The seat belt is only one of a battery of therapeutic devices which can control a major disease in our midst. The seat belt works best when it is combined with a good steering wheel to absorb the energy of the chest, and a good dashboard and a padded header strip.

We have no criteria for anything other than the seat belt at the moment. I believe that we need Federal leadership here. And we are merely in H.R. 1341 asking for Federal leadership; we are not attempting to regulate interstate commerce.

Mr. CHAIRMAN, if there are any questions that you or members of the committee should like to ask me, I will be glad to answer them.

Mr. ROBERTS. What would be your opinion about the industry suggestion of an advisory committee to advise the appropriate Federal agency charged with the responsibility of the administration of H.R. 1341, in the event of its passage at the present time?

Mr. MOORE. I do not think that you can possibly carry out the intent of H.R. 1341 without the consent and advice and participation of the industry, because certainly these men are the most expert on whom you could call for advice in the development of the criteria and standards.

I think as I read H.R. 1341, the intent of the bill is not that we shall prescribe for them how they shall build their cars. We merely say that there are certain basic things which should not be violated at a future time. If we need 25 percent elongation in the seat belt, and the industry thinks we need 30, the industry with research tools is certainly in the most unusual position to consult and advise with us.

Anyone who enacts the administration decision without the advice and consent of the industry, I think would be very foolhardy. I would just hope, Mr. Chairman, at this time such a group convened would invite those of us who have spent a number of years in research to participate with them and to share knowledge which has not yet become available in the normal channels of literature.

Mr. ROBERTS. Would not that information naturally come into the picture, because I know that Cornell University, along with studies made through industry grants, has been doing some research work for the Federal Government.

Mr. MOORE. The Cornell grant and the acquisition of the knowledge we have now about accidents, first the accidents which cause injury or death, and second the accidents, has been made possible only because of bipartisan participation of both Government and industry. And it is certainly, I believe probably the largest mass of data in existence in the free world anywhere today.

Without any support this program could not have been undertaken.

We have at Cornell—and I say “we,” although I am no longer there—become aware of the importance of learning how to work with industry, how to supply them with the known information on which they can predicate their decision of making an improvement in their product, but I do not like to have my leg pulled by people who discuss with me product improvement versus the question which Mr. Rogers asked about the safety improvement of that product. I think these are two different issues.

A product improvement may improve the salability of the commodity, but it may not add one whit to the safety of that product. I think I am entitled to make that statement.

Mr. ROBERTS. The gentleman from Ohio has a question.

Mr. SCHENCK. I think Mr. Moore is just reemphasizing his well-formulated opinion and well-justified opinion that the Federal Government, if it is to establish standards for safety for automobiles, ought to take full advantage of all of the industry and professional people who already have had all of these experiences and all of this information. It would be impossible in time and in money to duplicate that by any governmental agency.

Mr. MOORE. Mr. Schneck, I could not agree with you more. I think it would be the most foolish attempt in the world if H.R. 1341 did become law of the land, that we did not convene, as we have the precedent in similar acts of this sort, to take advantage of the existing body of knowledge of the industry and the research people who would be more than glad to gather thoughts to such work to the Government.

So at such time as criteria would be written, they would be entirely in agreement with the position of the best-known knowledge that has been obtained.

Mr. ROBERTS. The gentleman from Florida.

Mr. ROGERS of Florida. I certainly appreciate your testimony. It has been most helpful.

What was the figure that you gave about the 6-year period of the deaths in accidents?

Mr. MOORE. Mr. Rogers, in that 6-year period we have had the best estimate I am able to obtain from the national health survey and the Bureau of Vital Statistics between 28,000 and 30,000 occupants of passenger-type vehicles who have been killed in America.

Mr. ROGERS of Florida. About 30,000 a year?

Mr. MOORE. Per year. We have an estimate, according to the national health survey, of about 4.5 million people annually who have been injured in motor vehicle accidents; approximately 200,000 of these 4.5 million have received permanent disabilities. And if I multi-

ply these figures by six, I see what we have not accomplished since we have introduced the changes of standard equipment for door locks and steering whels and optional equipment for seat belts and padding material on the dashboards and the header strips.

Mr. ROGERS of Florida. I have just one question about the proposed Government group to work on highway safety. You probably heard the testimony this morning about the interdepartmental agency for highway safety. Does that seem to you to be a proper approach, in trying to get some real research work done on this subject?

Mr. MOORE. I would have to go back to the testimony, as I said before, of Mr. Roberts' committee on this subject. I pleaded at the time that these hearings were held in 1958, I believe that man in America so depends on the modern automobile that we have the parallel which is of such magnitude and importance that we perhaps need a comparative agency such as the National Advisory Committee for Aeronautics was, which put America in a preeminent leadership position in air transportation.

I was convinced after presenting my testimony, which is a matter of record, that Congress was not particularly interested in establishing any other independent governmental agency, that this matter then was best designed to go to that governmental agency which was best equipped to work on it.

I am convinced from testimony this morning and conversations I have had over the last several years there is some confusion at the moment as to where in the governmental structure, as it is now established administratively, this responsibility lies.

I would not back off one moment from the things I have said in that initial testimony before Mr. Roberts' committee, that we have a need—we cannot afford to buy the injury and disability and cost which is presently associated with the world's greatest concept of transportation, and we must have some agency to handle it.

I believe that at the root of our problem of the first and second accidents lies the human equation.

As to which of the governmental agencies is best qualified to work adequately with the human equation, I am not prepared to state. I am not an engineer. I am not qualified as a physician, although my vocation has been in medicine. This I would leave to the judgment of the committee and in conference with proper governmental agencies.

Mr. ROGERS of Florida. Thank you very much.

Mr. ROBERTS. Thank you, Mr. Moore.

Mr. MOORE. Thank you.

Mr. ROBERTS. Our next witness is Mr. Leonard W. Mayo, executive director of the Association for the Aid of Crippled Children of New York City.

We are glad to have you here, Mr. Mayo.

STATEMENT OF LEONARD W. MAYO, EXECUTIVE DIRECTOR, ASSOCIATION FOR THE AID OF CRIPPLED CHILDREN, NEW YORK, N.Y.

Mr. MAYO. Mr. Chairman and members of the committee, I must confess at the outset that I come before this committee as a tyro, as

a newcomer in a field in which this committee has already established its interests and its expertise.

Now, my name has been announced.

I will state briefly the function and the program of the Association for the Aid of Crippled Children in order that you may have some knowledge of our interest in testifying at this time.

We started 11 years ago in support of basic research with respect to the causes of death before birth and during the birth process. At that time very little money, either public or private, was being spent in the pursuit of this very difficult research in this country. A great deal of money is now being spent in this pursuit and in pursuit of such research.

As we saw some progress in research in this area, our attention was called to the fact that whereas we probably lost more children before birth than after birth, the greatest single cause of death after birth in most age groups among children occurs in relation to automobile accidents and is due to automobile accidents. Therefore we were compelled to give some attention, under our mandate, namely the prevention of crippling diseases and conditions among children, to an area which up to now had been outside of our area, and in which we still consider ourselves learning.

I came to this meeting this morning primarily not to speak, but primarily to learn, and I am learning.

I may say, Mr. Chairman, that the account of the hearings of this subcommittee, particularly the one I hold in my hand, under date of July 7, 8, and 9, 1959, has become a textbook and a guide, a motivation and an inspiration to us in the development of our program.

In studying the whole area of accident prevention, we found, as I stated, that the causes of crippling and particularly of death as caused by automobile accidents made it necessary for us to inquire into this field. It has not been an easy exploration. One finds interesting things and a lack of interest in surprising places.

I want to compliment this committee in its persistence in sticking to a subject which is without the glamor of crime and which does not as yet enjoy the strong public backing of such issues as the rackets.

As yet, this is an unpopular cause, and it is gratifying to a private citizen to know that a committee of the Congress is applying itself to this kind of purpose and this kind of cause so assiduously and with a scholarly intent.

I have heard this morning some interesting comments with respect to the extent to which the U.S. Government should participate in research in this field.

Congressman Rogers from Florida, let me say that I was particularly interested in your comment on this point. As a newcomer to this field I can only say that having spent the last 11 years working with research scientists in the fields of biological sciences, in cancer research and neurological diseases and the like, it has been established that the participation of government in medical research, far from drying up the sources of private research in private organizations which correspond to industry in the field of automotive safety, has increased both the intensity, the number of personnel involved, and the number of dollars spent.

So I think we have a precedent of some distinction and importance to the effect that the leadership of government, not just its intervention and participation, but its leadership, properly expressed in a field of research, benefits the entire field.

There are just three points that I would like to make briefly with respect to H.R. 1341.

The record of the saving of the lives of children over the past quarter of a century is one where great progress has been made not only in the saving of life before birth, particularly during birth, but great progress has been made in the saving of lives from children's diseases. These so-called miracle drugs, better obstetrical care, improved knowledge in pediatrics, improved additional knowledge on the part of parents, have all led to a very dramatic decrease in the death of children from the diseases of childhood and related causes.

The same advance has not been seen, unfortunately, in the field of automobile accidents. And it is this field that all of us, the automotive industry, the engineers, social scientists and all of the public owners and parties join hands in wishing to see research go forward.

If I might comment briefly on the whole question of standards, it seems to me obvious that there must be too in this field, as in other fields, that adequate standards cannot be set without adequate research. And I think there is no one in this room or in the United States who would claim that adequate research has yet been undertaken with respect to any of the three major areas of automotive safety research, namely, highway and driving conditions, the state and condition and competence of the driver, and the relationship of driving to human behavior in general. And third, but far from least, in our humble opinion, research having to do with the extent to which automotive design can help to prevent accidents and serious accidents, even when one has a driver who is not well prepared, one has a driver who is ill, one has a driver who finds himself in the situation where no human being could think his way out of it fast enough.

Of these three areas of research that appeal to commonsense, I believe that whereas we have over 70 million cars, and heaven knows how many drivers and new cars coming up each year and a new crop coming up each year—whereas we have multiple problems when it comes to research in the other areas I mentioned, namely, highway research—this, of course, must go forward. The key to a further creative basic and applied research in automotive design can be undertaken, intensified greatly and improved in the next 10 years by increased efforts on the part of a relatively few groups in the United States.

The U.S. Government and private organizations, of course, and the automotive manufacturers themselves can do this work.

I was very pleased to read in the proceedings of last summer on page 55, in the summary given by Mr. William Sherman, the secretary, I believe, of the Engineering Advisory Committee of the Automobile Manufacturers Association that he strongly approved and supported the participation on the part of the Federal Government in such research. And I believe in that statement he mentioned two of the areas of research which I have mentioned, namely, driver relation to the machine and the highway.

I think in that particular summary statement did not mention continued research in car design, but I am sure that he supports such research. Previous statements I think carry that out.

This law applicable to all makes of vehicles would remove safety devices from the field of competition among manufacturers if, indeed, this is a major problem. I understand that some manufacturers have argued that price competition discouraged them from installing sometimes inexpensive safety devices. If they were required of every manufacturer, competition would no longer exist. I am not sure that the manufacturers hold that view.

The leadership that they show in so many areas in giving advances to the American people would lead me to the conviction that the supposition, at least, that they would not be too concerned about the matter of competition when it comes to a matter of safety and the protection of the public health would be correct. Many members of the general public hold Federal specifications and practices in high regard. It seems to me that when it became known that certain safety devices were required in Federal automobiles that many citizens would follow the example of the Government and many companies and corporations, too, and demand these devices in their own vehicles.

And finally, the passage of such legislation, I believe, would constitute official recognition of the value of these devices develop it largely by the manufacturers themselves, and that it might encourage further development on the ground that other devices might similarly be the subject of legislation, instead of our having to wait the slow process of public acceptance.

Gentlemen, our interests in this field is such that we have asked the Consumer Union to join with us, our association, in the conduct of a conference which will be at West Point the middle of May on research in automotive safety design to which I have invited engineers, the manufacturers, scientists, and a number of other people who are vitally interested in this field.

Thank you very much for this opportunity to express a view.

(The prepared statement of Mr. Mayo follows:)

ASSOCIATION FOR THE AID OF CRIPPLED CHILDREN,
New York, N.Y., March 24, 1961.

STATEMENT IN CONNECTION WITH H.R. 1341

The Association for the Aid of Crippled Children, an endowed foundation dedicated to the reduction of fatalities and disabilities in children, is deeply concerned over the deaths, disablements, and disfigurements produced in children by the automobile. Today, the automobile is the leading cause of accidental death in children of most age groups. As further advances are made in obstetric practices, the use of antibiotics and other medical techniques, it seems clear that the leadership of automotive deaths will be not merely maintained but advanced.

After a year-long study of the research and the action programs designed to reduce the automotive death toll, the Association for the Aid of Crippled Children is convinced that modification of the vehicle is one of the most important and most neglected means of achieving such reduction in a relatively short time. Obviously it is not the only means, but, equally obviously, it is the only one whose implementation depends upon half a dozen manufacturers and not on the changing of attitudes and practices of many thousands of law-enforcement personnel and many millions of drivers. Most safety devices can be built in so that neither their presence nor their functioning depends on the attitude, condition, or whim of the user.

The effectiveness of most of the safety devices currently proposed for incorporation in Government vehicles has been clearly proved by the Cornell crash injury research project and by other studies. But the importance of H.R. 1341 extends far beyond protecting Government personnel from death or disablement. Among the less tangible effects are the following:

(1) Passage of H.R. 1341 would set an important precedent of Federal regulation of an area of activity that is of nationwide concern.

(2) Enactment of a law applicable to all makes of vehicle, would remove safety devices from the field of competition among manufacturers. Some manufacturers have argued that price competition deters them from installing even the most inexpensive safety devices. But if such devices were required of every manufacturer, competition would no longer exist.

(3) Many members of the general public hold Federal specifications and practices in high regard. When it became known that certain safety devices were required in Federal vehicles, many citizens would follow the example of the Government and demand these devices in their own vehicles.

(4) The passage of such legislation would constitute official recognition of the value of these devices, developed largely by the manufacturers themselves, and might encourage further development on the grounds that other devices might similarly be the subject of legislation instead of having to await the slow process of public acceptance.

For all these reasons, in addition to the immediate and obvious desirability of protecting Government personnel, as executive director of the Association for the Aid of Crippled Children, I strongly urge the passage of H.R. 1341.

LEONARD W. MAYO,
Executive Director.

Mr. ROBERTS. Thank you, Mr. Mayo, for your very encouraging statement and for expressing the concern of your organization in the field of crippled children. We know about that organization and we are deeply grateful to you for your appearance here today. The Chair has no questions.

Mr. SCHENCK. I want to join in that commendation of your statement.

Mr. ROGERS of Florida. I want to say, too, that it has been helpful to have your views here and those of your organization, and to know of this interest in this field.

In beginning these hearings, and in going into some of this problem, it appeared to me that we are not doing anything in the field which accounts for the greatest death factor of young people in the age bracket of 1 to 35. It also accounts for 40 percent of the third largest cause of death in this country, not to speak of the millions who are injured. Here is a tremendous loss in our communities everywhere. And here we are doing nothing about it. Yet the automobile manufacturers are doing all they can. It is a field in which we can be helpful in trying to point out some leadership in research.

Mr. MAYO. In such a matter of such basic health concern it would appear that the Government could hardly fail to participate in it to a greater degree.

Mr. ROGERS of Florida. Thank you very much. That is all.

Mr. ROBERTS. We thank you again, Mr. Mayo.

Mr. MAYO. Thank you.

Mr. ROBERTS. Our next witness is Mr. Edward A. Tenney, of Barton City, Mich. We are glad to have you before us, Mr. Tenney. You may proceed.

STATEMENT OF EDWARD A. TENNEY, BARTON CITY, MICH.

MR. TENNEY. Mr. Chairman and gentlemen, I am a private citizen by the name of Edward A. Tenney who has an intense interest in this subject, and because of that intense interest I ask the Chair if I might enter a bit of testimony.

The history of auto making and auto advertising for the last 6 years illustrates the fact that the auto industry is incapable of legislating for itself laws which promote our common safety. Because of this historical fact and because the industry shows no inclination to change, Federal legislation is needed.

In 1955 the horsepower race among our leading manufacturers led to a severe criticism of the practice of putting motors designed for racing cars into ordinary stock cars. At that time it was considered contrary to the public welfare on public highways to have cars which were capable of speeds over 90 miles per hour. On June 6, 1957, the leading manufacturers reached a gentlemen's agreement—and this committee is well aware of what that agreement was—that they would cease to emphasize tremendous speed and enormous power and would call off the horsepower race so as to lessen the entirely human temptation to drive at speeds way beyond what is reasonable and prudent for boys and girls, men and women.

In 1960 General Motors plastered the billboards across the Nation advertising the Chevrolet as "Sixties Sizzler" and showed it streaking down a road. One of the 1961 Chryslers was announced in Motor News as having a motor which would propel it at 140 miles per hour or better. I have here the announcement for Motor News for January 1961, page 25, which states that the 300-G can reach a top speed of over 140 miles per hour. This speed is almost that of the racing cars at the Indianapolis Speedway 500-mile Memorial Day race.

Such speeds sometimes kill even the expert drivers and sometimes the spectator also. The historical fact is that the gentlemen's agreement appears to have been broken. In 10 years' time these 140-mile-per-hour cars will be purchasable by teenagers at a hundred dollars or so. And when a teenager soups up one of them it will be a sizzler in the seventies.

Present legislation has to consider future consequences. The car which the general rides in today may be the car which the child pilots 10 years later. All racing cars should have bucket seats, safety harnesses, and the like not only for the present protection of important people but for the safety of the little people 10 years hence. Our Government owes it to the next generation to purchase only those cars in which the safety features are equal to the potential speed.

Another reason why the auto makers must be encouraged to design and produce safer cars is their attitude which appears to me to be hypocritical. In 1960 General Motors ran a series of very expensive full-page ads in many popular magazines with the head "The Cars are Safer—The Roads are Safer—The Rest Is Up to You." These advertisements are addressed to boys and girls. They may be obtained from General Motors free for posting on bulletin boards in driver education classrooms. As we all know, it is truer to say that in 1960, according to the statistics of the National Safety Council, "The cars were 1 percent more dangerous, the roads were 1 percent more dangerous, and 1

percent more of us was killed in 1960 than in 1959." It appears to me to be hypocritical to be quietly putting more power under the hood while preaching the greater safety of the car.

A third reason is that the auto makers have helped shift the responsibility for accidents from themselves to the public schools by promoting driver education. Cars are donated or loaned to schools by auto dealers. Having promoted teenage driving and car ownership by this device, the auto makers advertise that those who kill themselves are to blame. To the parents of the dead this may appear doubtful, especially to the parents who did not want their children encouraged to drive until they were out of high school and more mature.

The auto industry spends millions putting children on the road, age 14 and up, by means of driver education. This is the most doubtful education we have. In 1956 in Michigan we made driver education mandatory for the 16-18 age group. One hundred percent of the potential group enrolled. In 1958 we Michiganites killed 1,334 of us; in 1959, we killed 1,440; in 1960, we killed 1,545.

These deadly statistics which show a 16 percent increase of 1960 over 1958 suggest, first, that the roads are no safer; second, that the cars are no safer; third, that driver education kills more than it preserves; and, fourth, that the auto makers ought not to promote driver education in the public schools but should assume their own share of responsibility for accidents.

I think that bills like the Bennett bill and the Roberts bill will have a wholesome tendency to sober up the auto makers and cause them to spend their money not on so questionable a thing as driver education but on so certain a lifesaving device as the seat belt.

They are boring holes, as I understand, in the bottom floor of cars to put in these fastenings.

There are driver education classes in operation at this moment in which the boy is being taught to drive without a safety belt. I could say a lot more about this, but my time has run out. I have made my statement, and I thank you, Mr. Roberts.

Mr. ROBERTS. Thank you, Mr. Tenney. We always appreciate the contribution of private citizens to our hearings. We are glad and happy to have your statement.

I have before me a letter from the General Services Administration dated March 28, 1961, which I will make a part of the record at this point, without objection.

(The letter dated March 28, 1961, follows:)

GENERAL SERVICES ADMINISTRATION,
Washington, D.C., March 28, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety,
Committee on Interstate and Foreign Commerce,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: This is with further reference to your letter of March 13, 1961, requesting the General Services Administration to furnish your subcommittee a statement for the record in connection with H.R. 1341 containing certain information concerning Government-owned, passenger-carrying motor vehicles.

Accordingly, attached hereto is a statement which sets forth the following requested information:

1. Number of passenger-carrying motor vehicles purchased by GSA for Federal agencies during the past 3 years.

2. Number of passenger-carrying motor vehicles bought by Federal agencies during the past 3 years.

3. Number of passenger-carrying motor vehicles operated by Federal civilian agencies as compared to the Department of Defense.

We are happy to furnish you this statement and trust that the information contained therein will be helpful to your subcommittee. In addition to this statement we have furnished you this agency's comments on the subject legislation by separate letter.

Sincerely yours,

JOHN L. MOORE,
Administrator.

STATEMENT FURNISHED THE SUBCOMMITTEE ON HEALTH AND SAFETY OF THE HOUSE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE BY THE GENERAL SERVICES ADMINISTRATION CONCERNING PASSENGER-CARRYING MOTOR VEHICLES IN CONNECTION WITH H.R. 1341

1. Number of passenger-carrying motor vehicles purchased by GSA for Federal agencies during the past 3 years:

	1958	1959	1960
Sedans.....	5,265	4,801	3,562
Station wagons.....	1,009	768	701
Buses and ambulances.....	114	86	51
Total.....	6,388	5,655	4,314

2. Number of passenger-carrying motor vehicles bought by Federal agencies during the past 3 years:

	1958	1959	1960
Department of Defense:			
Sedans.....	1,856	2,531	2,404
Station wagons.....	1,008	1,806	1,558
Buses.....	216	499	837
Ambulances.....	178	154	215
Total.....	3,258	4,990	5,014
Tennessee Valley Authority: Sedans.....	200	150	200

GSA's title 1 regulations require all Federal agencies, except those specifically exempted, to advise this agency of their vehicle requirements for consolidated procurement by GSA. Agencies, other than DOD and TVA, purchase vehicles for themselves only upon specific clearance from GSA. The Comptroller General monitors this situation very closely to assure that the advantages of consolidated procurement are being obtained. As a result, during the past 3 years, all procurement of passenger-carrying motor vehicles for Federal agencies, except as cited above, has been accomplished by GSA.

3. Number of passenger-carrying motor vehicles operated by Federal civilian agencies as compared to the Department of Defense:

	1958	1959	1960
Civilian.....	24,752	25,536	26,722
DOD.....	30,953	28,424	27,630
Total.....	55,705	53,960	54,352

(The following additional information was later submitted by Mr. Moore:)

GENERAL SERVICES ADMINISTRATION,
Washington, D.C., April 6, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and
Foreign Commerce, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: By letter dated March 28, 1961, I furnished your subcommittee, at your request, a statement for the record in connection with H.R. 1341 containing the following information concerning Government-owned passenger-carrying motor vehicles:

(1) Number of passenger-carrying motor vehicles purchased by General Services Administration for Federal agencies during the past 3 years.

(2) Number of passenger-carrying motor vehicles bought by Federal agencies during the past 3 years.

(3) Number of passenger-carrying motor vehicles operated by Federal civilian agencies as compared to the Department of Defense.

With respect to item No. 2, the statement covered passenger-carrying motor vehicles bought by the Department of Defense and the Tennessee Valley Authority during 1958, 1959, and 1960. As a supplement to item No. 2 the following information is submitted covering passenger-carrying motor vehicles procured by the government of the District of Columbia:

	1958	1959	1960
Sedans.....	179	52	74
Station wagons.....	8	60	5
Buses.....	1	8	2
Ambulances.....	2	1	1

The above supplemental data completes the information requested in your letter dated March 13, 1961, concerning Government-owned passenger-carrying motor vehicles. We are happy to make this information available to you and trust that it will be helpful to your subcommittee.

Sincerely yours,

JOHN L. MOORE, Administrator.

Mr. ROBERTS. We will recess at this time until 2:15 o'clock this afternoon.

(Whereupon, at 12:15 p.m., the committee recessed, to reconvene at 2:15 p.m., the same day.)

AFTERNOON SESSION

Mr. ROBERTS (presiding). The subcommittee will please come to order.

Our first witness is Mr. James R. Turnbull, of the National Auto & Flat Glass Dealers Association.

We shall be glad to hear from you now.

STATEMENT OF JAMES R. TURNBULL, NATIONAL AUTO & FLAT GLASS DEALERS ASSOCIATION; ACCOMPANIED BY ROBERT L. BOUCHARD

Mr. TURNBULL. Mr. Chairman and gentlemen, we appreciate the opportunity to appear before you because conflicting dates would prevent a subsequent appearance.

My name is James R. Turnbull, representing the National Auto & Flat Glass Dealers Association, and I have with me this afternoon to

stage some demonstrations concurrent with my presentation Mr. Robert L. Bouchard of the Glass Distributors, Inc., Washington, D.C., and a member of our organization.

I represent the National Auto & Flat Glass Dealers Association, and organizations affiliated with them in their efforts to restore to the motoring public the standards of auto glass safety which they enjoyed from 1938 until recently.

We are concerned with the unilateral, unpublicized changeover in the type of glass used in the side windows and vent windows of American-made cars of current manufacture. This change has been going on since 1956 and became universal for the cars of all manufacturers in 1960. Yet it was not until February 8 of this year that the Automobile Manufacturers Association felt obligated to inform the public that the change had taken place.

I am going to ask Mr. Bouchard to break two pieces of glass, one piece of laminated glass and one piece of tempered glass, to show you the characteristics of the two products.

From triple-thickness laminated safety glass in door windows, every maker has now changed to single thickness tempered glass. For some manufacturers, this is also true of the vent windows.

We contend that this change, and the nature of the product so introduced, confronts the public with new and unusual hazards, not solely or necessarily related to the hazards which can be anticipated in an automobile accident or collision.

He is holding up a piece of laminated glass which has been subjected to the same type of impact which disintegrated the tempered glass.

We are here, therefore, to plead for the inclusion in H.R. 903 of a provision which would require motor vehicle manufacturers to use laminated safety glass in all windows forward of seated passengers.

The events of the past 2 years have clearly established that there is a need for a national body which will take proper concern for private motor vehicle safety insofar as methods of construction and materials are involved.

The individual States have legislated and are continuing to legislate on some aspects of car construction and equipment. This is especially true of auto glass, and bills are presently before the legislatures of six States. The protection of the public in this respect is certainly a matter of concern for State legislatures, but the automobile industry is able to oppose it effectively at this level by many means, including economic threats.

In the material which we now wish to present to you for your deliberations, I am hopeful that you will agree our case is not only reasonable, but well documented. We are a small organization and our resources are limited. We are opposed—and quite strongly opposed—by the giants of industry and by those over whom they exert economic domination. This is a challenge, however, that we have been glad to accept in the public interest.

Why did the car makers change the type of glass?

The motive is clearly established as monetary. A single thickness of heat-tempered glass is unquestionably cheaper than two pieces of glass bonded together with a layer of tough rubbery plastic. That is the saving the carmakers are enjoying now. But this is not all they

are looking for. The physical nature of tempered glass will enable them, in subsequent years, to incorporate metal attachments, handles and the like, by drilling holes in the glass prior to tempering. What this hardware will do to the glass performance is of less concern than the savings in assembly labor that it will make possible.

This vent light, with attached hardware, is representative.

I will ask him to break that. It is a tempered glass light from a current model car.

However, when the glass does break, it will build up the cost of the replacement package to the car owner—a minimum of three times the present cost, and more likely five times the cost.

Should the car maker's monetary motive be questioned, I refer you to the sworn testimony in the current proceedings of the Federal Trade Commission versus Libby-Owens-Ford Glass Co. and the General Motors Corp. In that testimony you will find clearly established that General Motors changed because tempered glass was cheaper and because the Chrysler Corp. had already changed to tempered glass and, in the words of a high General Motors executive, "It hadn't hurt Chrysler's sales any."

We might add parenthetically, how could it have hurt Chrysler's sales when the public was kept in ignorance of the change?

Laminated safety glass is not under challenge. It has a wonderful record of performance over its 25-year history; therefore, we ask the question: Is tempered glass as safe as laminated safety glass?

The car makers say it is. Having already made the change and having decided to give the buyer no option, what else could they say? To support their contention, they will mainly cite accident, that is, collision accident, statistics. I think all of us know that on today's highways anything that can happen to the human body and to a machine is going to happen in some manner or form. The car makers are on fairly good ground here in arguing about auto glass because their own statistics prove that, up to now, auto glass has been a minor factor in collision injuries. The bulk of car mileage involves driver-occupancy only. Therefore, depending on the statistical source used, from 35 to 50 percent of all injuries were caused by the steering wheel. We are not here to outlaw the steering wheel, or the man behind it. We want to give him the ultimate protection he deserves from the glass that surrounds him.

What are the major safety differences between tempered glass and laminated safety glass? This is the most important one—flying glass. If the human body, or any portion of it, strikes either laminated safety glass or tempered glass, injury can and may result, depending on the circumstances. But tempered glass can reach out to cause injury. In other words, the glass comes to the passenger, not the passenger to the glass.

The samples that we are breaking here are contained in a specially made box so that they do not travel any significant distance, but I am going to ask Mr. Bouchard to break another piece of tempered glass, so that we can observe the breaking phenomena.

Well, that one appears to have been improperly tempered, which is something we can discuss later on.

I have here, with examples, hundreds of reports collected by members of our organization on the breakage of tempered glass. In many

cases, the glass exploded, showering the interior of the car, sometimes in large chunks and spears, such as these examples. Now, our members are not in the auto body business, we don't repair or salvage wrecks, so we do not have an opportunity to talk to many car owners who had broken glass under collision circumstances. In other words, we get to talk to the lucky ones.

As a single example, I should like to cite excerpts from a letter in which a father tells of a typical recent accident. The complete letter is attached.

This was a side or intersectional collision, the most common type, and it exemplifies the hazards inherent in the use of tempered glass for door and vent windows.

My son was riding in my car, sitting on the right front seat. * * * Another car collided with the right side of my car, and upon impact, the glass in the two right doors of my car shattered as if they had exploded. The inside of my car was showered with small jagged pieces of glass, and the right side of my son's face was likewise showered with small pieces of glass. His ear was shattered and plastic surgery was required immediately. Glass was found in my son's hair and inside of his clothes, and Dr. Sullivan, the plastic surgeon, advises me that he will have a permanently scarred ear.

Another:

I was driving a 1958 Plymouth station wagon, and after the accident I found glass everywhere in the car, on the seats, under the seats, on the floor, on top of the dashboard, and back of the storage space.

I feel that when I bought a new Chrysler product, I had definitely been misled into believing that the car had as standard equipment "safety glass." It had always been my opinion that the term "safety glass" meant glass held together by plastic binder in order to prevent shattering. The glass that is contained in my present car should not be called "safety glass" but should properly be designated as exploding glass. The public has a right to expect that in this modern day and age safety measures will be taken in such manner as to fully guard the lives of our citizens.

This instance clearly illustrates how, with tempered glass, you don't have to wait to be hurled against the glass in order to be hurt. This glass will come to get you. In fact, a collision is not necessary. Breakage can result from a flying stone, slamming the door, raising or lowering the glass, a sudden rain shower—not to mention so many explosions of this glass which are completely unexplainable. Remember, many of those are documented in the testimony which we have submitted with this statement.

Remember, when we refer to breakage of tempered glass, we mean complete disintegration.

We have documented the nature of this product in a summary entitled "The 10 Dangers of Tempered Glass." We have documentation for every point—but we based our original compilation on the results of extensive testing work done in the laboratories of one of the largest research-based companies in the United States.

Here are the 10 dangers:

1. The quality and uniformity of tempered glass can and does vary.

Why? Mainly because there is no way to test a piece of tempered glass except by destroying it. There is no practical way to tell if a light of glass has been tempered except by breaking it. Result: There are already instances where plain untempered glass has gotten out as "tempered safety glass."

On behalf of laminated glass, all components of the sandwich are regularly checked and tested. Sample laminates and samples cut from stock-size sheets are readily available for quality control check tests.

2. Tempered glass is known to be nonuniform.

The propaganda for tempered glass says that it breaks only under a certain kind of impact and then it breaks into small, regular, harmless fragments. This is just not so, and there is ample documentation to prove it. Tempered glass is the offender in the mysterious "blow-outs" which have destroyed back lights in many cars over the past years. Poor annealing has left terrific strains and stresses and slight defects leave weak spots which are intensified under changes in temperature and heat distribution.

Laminated glass is consistent and uniform.

3. Tempered glass fragments are not harmless.

Even the small fragments of what might be called an ideal break of tempered glass can cut and cause permanent damage to eyes, even though the force that projects the particles is only the force of the suddenly released stresses. These stresses can be in the order of 140,000 pounds per square inch, and that is twice the pressure generated in a military rifle barrel when the shell is fired. However, add to the force of the stress a 60-mile-an-hour windstream in a moving car and you have a real velocity hazard for passengers anywhere within the car, as for example in a vent window.

Worse yet, large fragments are more common than any proponent of tempered glass will admit. We have documented samples of many breaks in tempered glass resulting in sharp-edged fragments from 1 to 3 square inches in area. We have dagger-shaped fragments several inches long, too.

Laminated glass retains most of the fragments.

4. Tempered glass is sensitive to edge break.

To visualize what this means, picture a child at a half-open door window. He is leaning against the glass and he has a metal toy in one hand. He bangs the toy on the edge of the glass, as children will—the glass disintegrates and the child is in the street. The edge-break sensitivity contributes to one form of the fallout hazard we discuss in item 5.

Laminated glass has no edge-break sensitivity.

5. Tempered glass when broken offers no protection against flying objects, missiles, or fallouts.

A flipped stone, a BB shot, an object falling from a passing vehicle, a piece of gravel tossed by a highway sanding truck—these typify the dangers of objects which break tempered glass and pass through with velocity almost unchecked. Tempered glass is not adequate protection from dangers outside the car.

Similarly, once broken, tempered glass, in a collision or skidding accident, leaves an unprotected opening from which passengers or driver can be thrown from the car. To be thrown from the vehicle is recognized as greatly increasing the danger of serious injury or death, especially in "rollover" accidents.

Laminated glass remains in place and retains energy-absorbing properties characteristic of the flexible plastic interlayer.

6. Tempered glass gives a thief split-second entry.

A tap with a metal punch such as Mr. Bouchard has been using here and the thief, after car or contents, is in. A quick removal of the fragments of tempered glass and there is no readily visual evidence to show the car has been tampered with.

It is possible to break out all of the glass in the average car under 10 seconds, if it is a tempered glass.

Laminated glass can be "forced" but it takes some time, and the cracked laminate remains as evidence that entry has been forced.

7. Tempered glass provides no emergency exit.

If you are trapped in a vehicle which is burning, or under water, and if the doors and window lifts are jammed by distortion of the vehicle body, there is no way out unless you or someone has a metal instrument to shatter the glass.

With laminated safety glass, elbows, knees, feet, even your hand can be used to force the laminate outward until it is freed from its supporting channel.

I have introduced with this testimony a case on February 22 of this year where three young people were trapped in a 1961 station wagon, while rescuers were helpless outside, and the three burned to death because the doors had been jammed in the accident.

9. With blunt objects, tempered glass is practically unbreakable and is unyielding.

Unfortunately, the blunt object most frequently striking the glass in automobiles is the human head, or other parts of the human body. The windshield is most commonly involved, and that is why windshields are 100 percent laminated glass. However, in the frequent accidents where one car is hit broadside, it is the side windows that are involved.

Laminated glass absorbs energy, cushions the impact, reduces or prevents injury. Tests with simulated skull structures in drop tests conducted by Cornell University have shown that, at the velocity which results in a fractured skull with tempered glass, no fracture resulted with laminated glass.

Mr. ROGERS. What type of glass was that?

Mr. TURNBULL. That is tempered glass and normally does not break under that type of impact, but it did in this case. Do you have another piece of tempered glass, and would you like to repeat that? It is possible that he had another fragment of glass on the instrument with which he struck it, and that caused the breakage in the outside skin of the glass.

Let us try it again. I think that establishes the unyielding characteristics of normal tempered glass.

9. With broken tempered glass, visibility is lost, or protection is lost, or both.

In some types of breakage, tempered glass remains in the frame temporarily, but becomes opaque. Visibility is gone. This could at the moment of breakage contribute to the seriousness of the accident or cause an accident. When the tempered window disintegrates, as is usual, there is no weather protection until it is replaced.

With laminated safety glass, substantial visibility is retained in most cases of breakage. Complete or substantially complete weather protection is also maintained in most cases.

I will not give more testimony on that. The evidence just given gives the facts of how far the glass can spread and the sound effect.

10. Tempered glass has an explosive break.

In addition to the physical force imparted to the fractured glass by the retained stresses, a window-sized area of tempered glass lets go, with a startling sound. At today's turnpike speeds and conditions, this effect alone is enough to cause or contribute to an accident.

With laminated safety glass, no sound is generated by the laminate itself.

What is the status and function of the American Standards Association code on automobile safety glass?

Many people, including some in governmental positions who should have reason to be better informed, are under the impression that the existing ASA code relates to the safety performance of automobile glass in use.

That is not the case. In fact, there is substantial ground for stating that the code has nothing to do with safety performance in use, or in a given location.

What the code does is to provide a series of test methods by which to determine whether any given material, as originally manufactured, is a good, bad, or indifferent example of its type. It enables the determination by a given test of whether a piece of tempered glass is a good piece or a poor piece. The same is true for laminated safety glass.

Furthermore, there are no stipulations as to the frequency of these tests. In other words, it is not a quality-control standard, although the tests may be used for that purpose by anyone who wishes to do so.

And the code has nothing to say about what happens to any of the products it covers after 1, 2 or 3 years of service. So far as the code is concerned, any type of glass, if it meets the provisions of the test when made, could fall apart a year later and still bear the designation AS1 or AS2.

Now I wish to submit to this committee the findings of the Interstate Commerce Commission in rendering its decision as to the type of glass to be used in vehicles under its jurisdiction. Although dated in 1937, it has particular significance for two reasons:

1. It is the only full and complete hearing of the same points of controversy we are now engaged in, before a truly impartial public body.

2. Since these hearings, laminated safety glass underwent a great technological improvement; therefore, the contrast in evidence is all the greater. In addition, laminated safety glass can be further improved by a factor of 200 percent or 250 percent. Tempered glass is not capable of improvement.

I will not read the entire proceedings at this time, but I feel that the findings on page 12 of this exhibit are pertinent.

You might be interested in looking at this to find that the automobile industry in its entirety appeared in 1937 with much the same statement as they will undoubtedly appear and make before this subcommittee on the matter of glass at a later date.

Findings of the hearing examiner, docket MC-4, Interstate Commerce Commission:

AMENDMENTS TO SAFETY GLASS REGULATIONS RECOMMENDED

The ICC, Friday, February 25, 1937, made public the report and order recommended by Examiner R. W. Snow in *Ex Parte No. MC-4, In the Matter of Qualifications of Employees and Safety of Operation and Equipment of Common and Contract Carriers by Motor Vehicle*. The report deals with the type of safety glass that should be used in motor vehicles subject to regulation.

Examiner Snow made the following findings of fact:

1. That laminated safety glass will withstand a more severe blow from a small, hard missile without breaking than will case-hardened glass.

The terminology used in this hearing was "case-hardened" and the most commonly used term today is "tempered glass."

2. That when a pane of laminated safety glass is fractured fewer particles of broken glass are separated therefrom than is the case if a pane of case-hardened glass is broken.

3. That laminated safety glass does not become opaque to the same degree as case-hardened glass when fractured.

4. That laminated safety glass may be broken and removed from the windshield and window frames by a blow from the hand, elbow, shoulder, or foot, and that case-hardened glass can only be broken by a blow from a sharp-pointed metal instrument.

5. When a serious accident occurs, occupants of motor vehicles and particularly buses may escape more readily if laminated safety glass is used than they could if case-hardened glass were used.

6. That laminated safety glass affords the occupants of a motor vehicle greater protection than does case-hardened glass and is of greater aid to the safety of operation of such vehicles.

7. That paragraph 4, section C(1) and paragraph 5, section C(1) of part III of the motor carrier safety regulations prescribed by the Commission, by order under date of December 23, 1936, in the above-entitled case, be amended so as to prohibit the use of case-hardened glass in any door or window opening in any motor vehicle operated by common or contract carriers in interstate and foreign commerce.

Mr. Snow recommends that after July 1, 1937, vehicles be required to use the type of glass he found most suitable.

That order was amended to permit the use of tempered glass provided it was housed in a push-out type mounting, so that the occupants could readily escape by pushing out the entire glass installation, including its metal mounting.

In conclusion:

As proper questions to bring before this committee, I wish to submit the following:

1. On what grounds can some car manufacturers justify the use of explosive tempered glass in vent windows which project in the same plane as the windshield?

2. On what grounds can the use of tempered glass in the windows next to the driver be justified, when an explosion of this glass can cause loss of control?

We have documents on this loss of control circumstance.

3. With options available on color, trim, even color of glass—and options on \$1,000 or more of extras—on what grounds can the car makers justify no option on the type of safety glass?

4. With the entrapment hazard compounded by the use of tempered glass, on what grounds can the car makers justify lack of provision for emergency exit? Should they not provide either a breakout tool, or pushout mountings, as required by the ICC, if they are going to continue to use tempered glass?

We have endeavored in the past and are continuing to make every effort to strengthen the safety glass laws of all the States, but because of limited resources and manpower we are able to work in only a few at a time.

The automobile industry opposition is powerful and well-organized and is not above using threats and half-truths. For example, in hearings in the State of Missouri, Mr. Karl M. Richards of the Automobile Manufacturers Association told the legislators:

In this bill it is provided that any vehicles assembled in the State of Missouri would have to have this type of glazing material. Well now, this is very important to motor vehicle manufacturers because St. Louis in your State has now become the second largest automobile motor vehicle section—

I believe it meant production—

in the United States and there is a possibility of repercussions on whether vehicles would be assembled in a State that made such a deviation from uniformity or whether the assembly would be in some other State where there wasn't that deviation.

And again:

Now, there are several unfortunate aspects that I have referred to in this attack.

The attack was the presentation of our organization.

In the first place, the integrity of the American Standards Code is under attack and, secondly, its national uniformity is being threatened instead of being threatened instead of following the correct procedure. Attempts have been made by the introduction of bills in Tennessee in 1957, in Pennsylvania in 1958, in Massachusetts in 1959, and in Louisiana in 1960. Fortunately when the facts were presented to these legislative bodies, they either voted the measure down unanimously or by overwhelming majority.

In this connection, I should like to quote from a newspaper story which appeared in the Haverhill Evening Gazette at the time of the defeat of the Massachusetts bill:

A massive lobbying effort defeated a bill to require laminated safety glass throughout all motor vehicles built after November 1, a cosponsor of the bill says.

Representative John J. Moakley, Democrat, Malden, sponsor with former Representative Louis H. Glaser, Democrat, Malden, said every representative had at least one telegram and many had two, urging they vote against the measure.

It was defeated on a standing vote, 69 to 8.

Moakley, majority floor leader, said he didn't know what organized group spearheaded the opposition but thought it was probably "the manufacturers."

WOULD CUT DEATHS

Moakley said that after talking with safety experts, he was convinced that laminated safety glass in all motor vehicle windows would cut down on death and injury in case of accident. "If it is the best for the windshield, then I think it is the best for the rest of the car," Moakley said.

Present law requires laminated glass only in windshields.

Moakley said he was told by a representative of an automobile manufacturer that if the bill was passed, it would add about \$150 to the cost of a car in Massachusetts.

Now, returning to the statement of Mr. Karl M. Richards of the Automobile Manufacturers Association at the Missouri hearings:

We would certainly warn any State against deviating from uniformity because of the costs and problems that it might entail.

It would seem that the American Automobile Manufacturers Association can use a reverse argument before a State body to that which it would use before a national body, such as this subcommittee.

Yet the State of Georgia and other States specifying laminated safety glass in the side windows and vent windows of cars for the State patrol are having no difficulty getting them so equipped.

Finally, of course, there is the somewhat embarrassing fact that tempered glass does not meet the full definition of safety glass in the laws of a number of States. This definition usually reads:

Glass * * * which * * * when struck or broken substantially prevents the flying of glass.

It is obvious to anyone who has seen tempered glass broken that this product not only does not prevent flying glass, it helps it fly.

In all public statements made by the proponents of tempered glass, our organization, the Auto Glass Dealers—individually and as an organization—have been singled out as being the sole malcontents who are opposed to the use of tempered glass.

This is not the case. We have broad support from organized labor, as indicated by the communications which I submit. We have active support from the National Society for the Prevention of Blindness, whose interest was aroused in part by practical experience with eye injuries. In ASA Code revision proceedings, we have had support on many major issues from the American Society of Mechanical Engineers, the Manufacturing Chemists Association, the American Trucking Association, and the Insurance Institute for Highway Safety.

And so, in closing, we strongly urge your favorable consideration for the addition to the provisions in H.R. 903 of a requirement to the effect that, forward of seated passengers, laminated safety glass shall be used in all motor vehicles intended for sale in interstate commerce.

We believe that this will most effectively assure the American motoring public of the standards of auto glass safety to which they are entitled and which they enjoyed in all American-made cars from 1938 until the recent "silent switch" to tempered glass.

MR. ROBERTS. I believe that you have certain exhibits that you wish to submit with your statement?

MR. TURNBULL. One exhibit is the letter concerning the accident case cited, and that was attached to the document I handed in.

Another is the compilation of the breakage reports for a representative period of several months, as our dealers are collecting them.

A third is a recent article from a glass journal on tempered glass and laminated safety glass.

MR. ROBERTS. I believe, Mr. Turnbull, without any objection we will include the main statement, but the exhibits are quite bulky, and I think it would make our record quite large to include those.

I will be glad to have these filed for the information of the committee.

MR. TURNBULL. They were brought solely for informative purposes, Mr. Chairman.

MR. ROBERTS. All right. They will be taken care of in that manner. Thank you for your statement.

(The documents referred to will be found in the files of the committee.)

Mr. ROBERTS. There are several charges that are raised in your statement which seem to me to be very serious ones, and I am sure that you have gone into the matter of those charges before you made them. You mentioned the abandonment of laminated glass made primarily for economic reasons, and in disregard of the safety of the passengers in the vehicles.

Mr. TURNBULL. May I comment on that?

Mr. ROBERTS. Yes.

Mr. TURNBULL. I made reference to the proceedings of the Federal Trade Commission. That record now is running very close to 2,000 pages. This is sworn testimony. I think on that point you would find it perhaps worthwhile to have a member of the staff review the testimony and excerpt for you the pertinent statements regarding the cost factor and the savings involved.

Mr. ROBERTS. I will be glad to take advantage of that suggestion and have the staff look into that record.

You have a comment in your statement with reference to H.R. 1341, but you directed your statement to H.R. 903, which is somewhat different than the proposal made in H.R. 1341, which is to have the Secretary of Commerce write standards or to prescribe what general safety standards would be in Government-owned cars.

How do you feel about the approach in H.R. 1341?

Mr. TURNBULL. I would be in favor of any investigative approach of the type which was discussed at this morning's hearing.

I would certainly welcome the opportunity to place our information and all pertinent information before any group so charged, whether it is within the Department of Commerce or it takes some other form; in other words, my remarks, while they were aimed primarily at H.R. 903, I felt that perhaps the information would be taken into context in terms of the intent of H.R. 1341.

Mr. ROBERTS. With reference to the handling of tempered glass and laminated glass, what is the conventional way of stocking tempered glass versus laminated glass?

Mr. TURNBULL. Speaking in the historical sense, most glass dealers draw their stocks from localized or regional distributors who carry reasonably complete warehouse stocks.

However, the stocking of laminated glass—flat laminated glass—has been a relatively simple matter, because this glass can be cut with ordinary glass working tools.

Therefore, one case of flat laminated glass would enable the dealer to replace any flat area in any car almost in a matter of minutes.

Since tempered glass cannot be cut, and since the stocking problem is going to grow in magnitude with each succeeding model year, the size of the warehouse depot and the size of the stocks the dealers must carry in order to give reasonably prompt service on replacements is going to be, well, almost staggering, which would be one means of stating it.

Mr. ROBERTS. Is that because the tempered glass has to be sized in order to meet the customer's demand?

Mr. TURNBULL. It has to fit precisely in the automobile; yes, sir. However, there has been a new development on the scene which may deserve mention. One of the glass manufacturers has announced a sort of do-it-yourself tempering oven, a rather small unit of low

capital cost, which means that any glass dealer of average size could install a tempering oven, cut his glass from plain sheet or plate stock, heat treat it to temper it, and then he would have a piece of tempered glass ready to install in any car.

From a quality control standpoint, with several thousand establishments tempering glass, it makes the chills run up and down my spine, because the quality control problem in the present large establishment is a very significant one.

Mr. ROBERTS. It was my opinion, from your statement, that laminated glass is used only in the front windshield?

Mr. TURNBULL. In the windshield, that is correct.

Mr. ROBERTS. Is that true with all of the manufacturers of automobiles?

Mr. TURNBULL. It is true of all American manufacturers.

Mr. ROBERTS. Is that the only place in the car where laminated glass is being used, so far as you know, by any manufacturer?

Mr. TURNBULL. One manufacturer is still—I am speaking now as of the current moment—using laminated safety glass in the forward vent window. I believe that the top General Motor's line, Cadillac, may still be using some laminated glass in door windows, but since I am not quite certain of the absolute current information I would dislike to state positively that that is correct, but I believe that Cadillac has recently been using laminated safety glass in door windows.

Mr. ROBERTS. I believe you stated that the changeover was made in about 1956?

Mr. TURNBULL. To reconstruct as best as we can establish it, Chrysler Corp. began to change some models in 1956. This is the calendar year 1956, for the year 1957. So I guess that you would call those 1957 model cars.

Earlier than that, during a period when one of the glass suppliers was on strike I am informed that the Chrysler Corp. briefly used tempered glass in some models for a short period of time.

General Motors Corp., according to our information, changed late in 1959 for most of their 1960 models.

The Ford Motor Co., to our knowledge, changed during 1960 for most of their late 1960 and 1961 models.

American Motors Corp., changed, to our knowledge, slightly after Chrysler Corp. did.

Mr. ROBERTS. I believe you mentioned that there were perhaps two types of glass approved by the American Standards group. I believe you designated them as AS-1 and AS-2.

Mr. TURNBULL. That is correct.

Mr. ROBERTS. That is tempered glass, I take it?

Mr. TURNBULL. It refers to the use of laminated plate glass which is required for windshields. The code does not require plate glass, which is the optical grinding and polishing of the glass in locations outside of the windshield. So the "2" designation refers to other than windshields.

Mr. ROBERTS. Other than windshields?

Mr. TURNBULL. Yes. AS-1 refers to windshields.

Mr. ROBERTS. Now the AS-1 designation, do you contend that you get the same type of explosion with it that you get from the AS-2?

Mr. TURNBULL. No. AS-1 is only laminated safety glass.

AS-2 can be either laminated safety glass or tempered glass. The tempered glass can be either tempered plate glass or tempered sheet glass.

Mr. ROBERTS. What you are contending is that the manufacturer should use laminated glass throughout the entire automobile?

Mr. TURNBULL. Forward of the seated passengers where there is a definite hazard on account of flying glass and including emergency escapes from the car. We believe that the manufacturers should use their—should use tempered glass where historically over the years they have mainly used it; namely, in fully enclosed locations which are to the rear of passengers. It would be the rear windows or the rear quarter window or the rear panel window in a station wagon type of body.

Mr. ROBERTS. Well, do you take that position because of the fact that the eyes would be more likely to be affected in the glass that is projected in front of the passenger in contrast to that which would be behind?

Mr. TURNBULL. That is correct.

Mr. ROBERTS. Now I believe you made a statement as to the cost of the two types, and you used the figure, if I remember correctly, of \$8 per unit. What page do you talk about the cost?

Mr. TURNBULL. There are two figures mentioned on cost. I think I indicated that the saving was in the range of \$7 to \$14 per unit, depending on the size, type, and model of car.

Mr. ROBERTS. \$7 to \$14?

Mr. TURNBULL. Perhaps an average figure somewhere around \$9 to \$10 might be average for all private automobiles. This figure that I mentioned was the ASA statement before various legislatures actually, that if they were required to change back they would cost the car buyer \$150 to have the laminated glass.

Mr. ROBERTS. Is the laminated made as optional on any models at the present time, that is for other than the front windshield?

Mr. TURNBULL. We have many private corporations who have ordered cars equipped with laminated glass and have had difficulties of getting them.

I cannot speak authoritatively on that subject, but General Motors did bring out a parts bulletin in January of this year offering as optional equipment laminated safety glass on the Corvan, which I believe is a light truck of the Volkswagen truck style. That is the only evidence I have seen of any optional choice.

Mr. ROBERTS. The subcommittee visited Detroit in 1956. I seem to remember some experiments at Chrysler Corp. where they were trying to design or come out with the type of glass that, on impact, would tend to crumble instead of shattering and shearing. Do you know what has been done with reference to that type of glass?

Mr. TURNBULL. I believe that may refer to a trend which is now going on in actual production toward the use of thinner tempered glass.

The available literature of the major glass manufacturers until recent months has stated that glass thinner than one-quarter inch cannot be satisfactorily tempered.

We understand the manufacturers have recently deleted that statement from their technical manuals, and glass thinner than one-quarter inch is now going into some cars, including Chrysler Corp. products.

I believe the exact thicknesses are seven thirty-seconds of an inch and three-sixteenths of an inch.

Now the thinner glass will break a little more easily and therefore would tend to minimize our service regarding head-concussion-type injuries.

However, we do feel from what we know of this type of glass that there will be a greater variation in the size of the particle that will result, perhaps more large and dangerous particles. I believe that was the experiment that was brought to your attention.

Mr. ROBERTS. Is the heating treatment the trick in making the glass less prone to shear and shatter?

Mr. TURNBULL. In the manufacture of tempered glass, the glass must first be heated to a relatively precise temperature and then cooled very rapidly so that the outside surface of the glass is almost most instantaneously cooled, while the inner section of the glass remains hot and still relatively soft.

This is what sets up the stresses in compression and in tension which makes the glass very difficult to break with a blunt instrument or on the normal type of impact you would expect with fractured glass.

It is also the determining factor, the degree of tempering and the kind of pattern of the air jets that should determine what size of fragments the glass would break into.

But this you will notice, if you can see, has broken into small fragments, but they are still agglomerated as a rather large chunk.

Now the individual little fragment might not be so bad, but chunks of this size—this is from this glass that we broke—chunks of this size with these sharp edges flying around inside a car I think you will agree could be quite dangerous.

Mr. ROBERTS. What are the qualities of the laminated that you believe make it ideal for protection of the passenger?

Mr. TURNBULL. The basic principle of laminated glass is the very adhesive plaster interlayer that forms the middle section, which allows the glass to break but without shattering into separate fragments, unless the force is greater than the plastic interlayer will withstand.

In other words, you can break laminated safety glass under extreme impact into chunks and fragments. But bear in mind, Mr. Chairman, we are not proponents of the present construction of laminated safety glass, although we think it is a much better product than tempered glass.

We would like to see this improvement which is known and is available in the properties of laminated glass by using a heavier and tougher interlayer.

Mr. ROBERTS. Does the industry of whom you speak make all types of this glass, laminated and tempered too?

Mr. TURNBULL. The major factors in the industry make both types. The smaller factors make only one or the other.

Mr. ROBERTS. Costwise per unit, mentioning \$7 and \$14, with an average of \$9, how much more expensive would it be to equip all of the windows forward of the passengers with laminated instead of the tempered?

Mr. TURNBULL. On a straight materials cost basis under \$3.

Mr. ROBERTS. Under \$3.

Mr. TURNBULL. Under \$3, less than \$3.

Mr. ROBERTS. Less than \$3 per unit?

Mr. TURNBULL. I am not talking about any differences in assembling labor to put the two types of glass in, but on the straight materials cost basis.

Mr. ROBERTS. I don't understand, because I thought laminated consists of two sheets and a plastic inside. Why would it not be more expensive than the other type?

Mr. TURNBULL. \$3 is a great deal of money.

Mr. ROBERTS. You mean \$3 more?

Mr. TURNBULL. \$3 more.

Mr. ROBERTS. I see.

Mr. TURNBULL. Yes.

Mr. ROBERTS. That is all.

Mr. O'Brien?

Mr. O'BRIEN. Mr. Chairman, I would like to ask, do any States now require that all vehicles assembled in those States be equipped with laminated glass?

Mr. TURNBULL. To my knowledge no State specifically requires, but in the past history of legislation, seven States have had specific exclusions of the use of tempered glass, which have been struck out of their State laws.

Mr. O'BRIEN. I notice you said the State of Georgia and some other States require laminated glass for State patrols.

Mr. TURNBULL. That is correct.

Mr. O'BRIEN. But they don't go beyond that?

Mr. TURNBULL. Not beyond that.

Mr. O'BRIEN. You indicate rather strongly in your testimony that you believe that efforts to bring that about in several States were defeated by pressure from the manufacturers, is that correct?

Mr. TURNBULL. That is correct, sir.

Mr. O'BRIEN. I note particularly in the case of the Massachusetts bill, which is described as a massive lobbying effort to defeat the bill, then I read on and I find that massive lobbying effort consisted of every representative having at least one telegram, some having two.

I might say that that might be a massive lobbying effort in Massachusetts, but I doubt if it would be much of an impact in Washington, because we average better than that on most of the bills that we have before us.

Mr. TURNBULL. I am quite sure you do.

Mr. O'BRIEN. I have no other questions, Mr. Chairman.

Mr. TURNBULL. The words "massive lobbying" were not mine. They were that which the newspaper, or should I say the particular Representative chose to use. Someone felt that it was massive.

Mr. O'BRIEN. Yes, I understand, it was a newspaper article. I spent some years in that business myself, and I find that an occasional exaggeration attracted more readers.

Mr. ROBERTS. Mr. Rogers?

Mr. ROGERS of Florida. Was there any earlier requirement that the laminated glass be used?

Mr. TURNBULL. Essentially laminated glass was the first safety glass introduced to American automobile manufacture. It would be too involved for me to try to tell you here the history of the evolution

of safety glass standards but it has been compiled in a form which is readily readable.

Mr. ROGERS of Florida. I wondered if there were an industry committee that got together and set standards for the safety glass?

Mr. TURNBULL. There were a number of committees which gradually took form as the ASA Code Committee, that is correct.

Mr. ROGERS of Florida. Has any such committee recommended against the use of this laminated glass?

Mr. TURNBULL. In the ASA procedures a code must be reviewed, revised, or reendorsed at 5-year intervals.

In 1959, the committee concerned with automobile safety glass, the S-26 committee held its 5-year review meeting and by vote of 26 to 8 automatically endorsed the code for another 5-year period.

The eight dissenting votes stated that the code needed revision because, while the code has had certain things to say about methods of test for glass, the fact that automobile manufacturers in the prior 5-year period, that is prior to 1960, had changed their practices in the use of glass, moving tempered glass from the back up through the sides and thence, made a full review of the code necessary and desirable. These were the eight dissenting votes.

The parent body of the American Standards Association, in reviewing the vote as they must, decided that a consensus of the committee had not been established, and that wherein the numerical significance of the eight dissenting votes, they outweighed the 26 in favor of automatically reinstating the code.

And the 26 were, of course, automobile industry representatives.

In the eight dissenting votes were our organization, the National Society for Prevention of Blindness, and some of the organizations whose names I have mentioned.

Since that date, in late 1959, the American Standards Code on automobile safety glass has been in a mild state of chaos and is currently being reviewed by a technical committee and six task groups who are reporting on April 11 to the parent-technical committee, recommending probably a rather broad scope of investigation leading to a revision of the code.

That April 11 date, Mr. Chairman, is one of the reasons why I would not be able to appear here on April 11.

Mr. ROGERS of Florida. Is this a safety group committee?

Mr. TURNBULL. The code—

Mr. ROGERS of Florida. You say a standard?

Mr. TURNBULL. This is a standards committee and it establishes minimum standards for auto glass and methods of finding out where the glass as manufactured in fact meets that minimum standard, simply by testing the glass to see if it does what it is supposed to do.

Mr. ROGERS of Florida. That is concerned only with the use of glass?

Mr. TURNBULL. That is correct, and it does not relate to the locational requirement of any given location in the car which is one of the things which we are trying to introduce into the code that a door glass shall perform this way, a windshield shall perform that way, a back glass can perform another way.

Mr. ROGERS of Florida. I notice you say that about 1956 the automobile manufacturers started moving away from laminated glass into the tempered?

Mr. TURNBULL. That is correct. The Chrysler Corp. was the first.

Mr. ROGERS of Florida. Was there any particular reason that you know of?

Mr. TURNBULL. We believe that the reason primarily is cost reduction.

Mr. ROGERS of Florida. What are the major glass manufacturers? How many are there?

Mr. TURNBULL. In the automotive glass field the two largest manufacturers historically have been the Libby-Owens-Ford Glass Co. and the Pittsburgh Plate Glass Co.

Some years ago Ford Motor Co. began to manufacture a substantial amount of its own glass, and today I believe it is not only supplying all of its own requirements but is a nationwide marketer of glass. Chrysler Corp. is now manufacturing glass for its own requirements. Shatterproof Glass Co. in Detroit is the largest manufacturer of both tempered and laminated glass, who is not an original equipment supplier to the automobile industry, or at least if he does supply original equipment it is relatively small.

Then there is a firm called Permaglass, which makes, I believe, only tempered glass. There is a firm in Philadelphia called Safetee Glass Co. which makes laminated glass, and I believe makes some tempered glass. From then on down there are perhaps a half dozen small glass manufacturers scattered around the country.

Mr. ROGERS of Florida. Are all of these members of your association?

Mr. TURNBULL. No. As a matter of fact, our association is the retail glass dealers, of whom in the country there might be 10,000, as members of our association probably around 500.

Mr. ROGERS of Florida. But none of the manufacturers of glass are members of your association?

Mr. TURNBULL. They are not, sir.

Mr. ROGERS of Florida. Have they taken any position that you know of?

Mr. TURNBULL. The major glass manufacturers?

Mr. ROGERS of Florida. Yes.

Mr. TURNBULL. I would say that currently they are taking the same position as the Automobile Manufacturers Association, and we know this because their technical representatives are appearing in opposition to our bills in various legislatures of the States.

Prior to 1959, I would say the situation would be the reverse, that the two major glass manufacturers were proponents of laminated safety glass, and members of their organization are so on record, and going back even further into history, in the ICC transcript which I have submitted, you will find that they were proponents of laminated safety glass.

Mr. ROGERS of Florida. This group that you speak of that is getting together in April, is it your association?

Mr. TURNBULL. We will be represented, but it is the American Standards Association.

Mr. ROGERS of Florida. If they decide that laminated glass should be used, will that be a requirement of the manufacturers of automobiles?

Mr. TURNBULL. Inasmuch as the ASA Code is used by many States in determining what glass is acceptable within those States, it would have been a very strong influence.

I would say if the ASA Code is changed, perhaps then the automobile industry, in the interest of what they call uniformity, would make a broad-scale change, but that is only my personal opinion.

Mr. ROGERS of Florida. It would be determined by State law as to whether certain standards were met? That would be the only actual requirement by law as far as you know. Whatever States might have as to standards that are adopted by the standards committee, that standard shall prevail in that State?

Mr. TURNBULL. Presumably the ASA action would have an effect on the action of the Uniform Motor Vehicle Code which is, in turn, used by the empowered State official, motor vehicle commissioner, or State treasurer, in drawing up his annual list of approved types of equipment or approved alternatives.

Mr. ROGERS of Florida. Is that used in all States?

Mr. TURNBULL. Not in all States, but it has a very, very wide influence.

Mr. ROGERS of Florida. How many would you suppose it is not used in?

Mr. TURNBULL. I think practically it may be used in every State but there are a number of States either the laws of which or the constitution of which prevent them from openly recognizing the fact that another body is deciding what they are going to approve.

Mr. ROGERS of Florida. Thank you. Thank you, Mr. Chairman.

Mr. ROBERTS. Thank you, Mr. Turnbull.

Mr. TURNBULL. Thank you for the privilege of appearing here.

(The following additional documentation was submitted by Mr. Turnbull:)

CHEVROLET DIVISION,
GENERAL MOTORS CORP.,
White Plains, N.Y., January 9, 1961.

Bulletin No. Dis. 0-42

To All Dealers:

Shown below are changes and additional prices affecting the 1961 Dealer Price Bulletin which was attached to letters dated September 20, 1960, October 6, 1960, and December 16, 1960. Please make the necessary entries on all copies of the price bulletin now in your possession.

SEC. II. CORVAIR 95

	Option No.	Dealer net	List price	Factory D. & H.	Manufacturer's suggested retail delivered price
Custom equipment, model R1206.....	431	\$152.00	\$200.00	\$15.20	\$215.20
Wheel covers:					
Models R1205, R1244, R1254.....	132	7.60	10.00	.80	10.80
Model R1206 (for use without custom equipment).....	132	7.60	10.00	.80	10.80
Model R1206 (for use with custom equipment).....	132	6.08	8.00	.65	8.65
Glass, laminated, front door windows only, R10 series.....	370	3.80	5.00	.40	5.40

SEC. III. TRUCKS

Glass, laminated, side door windows only, models C, K, L10-50.....	370	\$3.80	\$5.00	\$0.40	\$5.40
Generator: 35 amperes, low cut in:					
T60, T60H, not available with power steering	1,000	19.76	26.00	2.00	28.00
with 6 cylinder engine.....	1,000	14.44	19.00	1.45	20.45
T70, T80.....					

Orders for the above options may be submitted to the plants for January production.

Very truly yours,

H. B. TAXTER, Jr.,
Zone Distribution Manager.

Mr. ROBERTS. We have representatives of the manufacturers group present. Would they care to comment on the statement made by Mr. Turnbull?

Mr. RICHARDS. We would like very much, Mr. Roberts, to bring the technical glass experts from the various glass manufacturing firms and to present this whole case because this is a rather serious matter involving not only uniformity but involving safety.

Mr. ROBERTS. I think the subcommittee would certainly be glad to entertain that request.

It may require further consideration to give you a date to be heard but I think certainly we would want you to have that opportunity. We do have some hearings around the 11th of April, and if we can work out an additional date about that time, perhaps the 12th or some other date in there, and the clerk of the committee will advise us about that.

Mr. RICHARDS. We shall be very happy to be here.

Mr. ROBERTS. Are there any other witnesses, Mr. Clerk? I believe we had a statement—

Mr. Moore.

STATEMENT OF JOHN MOORE, CONSULTANT IN SAFETY RESEARCH

Mr. MOORE. Mr. Chairman, my name is John Moore. I am a consultant in safety research.

Mr. Chairman, it was my privilege to publish probably the first paper on the technical aspects of the difference between these two types of glazing materials as it affects injury.

This paper I will submit to the committee for insertion in its record. It was a study of 715 automobile accidents, in which injury was observed which had approximately 1,600 occupants who were exposed to the hazards of the two types of glass which have been discussed.

It was the finding of this rather limited piece of research at the time, which was read before the summer session of the SAE at Atlantic City, that out of the 1,600 occupants approximately 1,200 were injured to some degree. Twenty-six of these occupants had injuries whose injuries could be attributed to glazing material in the side lights of the vehicle.

One of these was injured by contact, or one of these injuries was attributable to contact with heat-treated or toughened glass. Twenty-five injuries which were of a lacerative nature were associated with laminated glass.

It was my privilege this summer as representative of the U.S. First International Scientific Conference on Road Safety Problems to hear a great deal of information from the English and the French and the European colleagues at this meeting about the method by which they had approached the problems, and the difference in the production and the control of these two types of glazing material.

I would suggest that the committee's professional staff could avail themselves of these technical reports without my taking your time at this point to discuss them.

I believe, however, that this points up most aptly the confusion which exists in so many places where we are endeavoring to reach for standards or criteria which everyone can observe.

The SAE code on seat belts is a nonenforceable code, as an illustration. SAE has no power for lobbying other than making available its knowledge to State bodies who would like to legislate. If they do not, they are not empowered to do so.

The American Standards Association, by its charter, is not primarily empowered to be a legislative lobbying body to see that its safety codes are observed. So we are back at the point we were in in our discussion this morning about the prime importance of H.R. 1341 and the establishment some place of a set of standards which could be useful for those people who want to have some leadership in knowing what they should and should not do.

I am not in a position to take an issue on the glass question as such. I would be delighted to make available to the committee the technical papers which I had the privilege of working on as the director of Cornell University crash studies, and the technical papers which are available from my English colleagues.

Mr. ROBERTS. You would say then, Mr. Moore, that H.R. 1341 offers an opportunity of tying the loose ends together and the differing and conflicting opinions on practically all matters of automotive safety, that is tying them together after proper hearing from the various standard groups, and bringing these loose ends more or less into one place where everybody would know that they could go and get proper information as to criteria being established.

Mr. MOORE. I would say that is true, Mr. Chairman, provided that we have agreement among the administrative sections of the Federal Government as to who is going to assume this responsibility.

I do not believe this is at all possible if we end up with another interdepartmental committee or a joint committee of loose sorts who have no function and no power to compel any action from any administrative branch other than call another committee when they get back to their own department.

Mr. ROBERTS. I think, as you pointed out this morning, that the Interdepartmental Highway Safety Board was said to be a coordinating group that would not have any authority to make policy or determine standards or even perhaps to consider recommendations by various engineering societies, whether they be representative of the industry or of the public or of Government or, as you say, with that type of approach you would find yourself simply back in the same old position of trying to find out where there is some authority to move in this field of safety.

Mr. MOORE. That is correct. I feel that committees are places where ideas are expressed and differences are adjusted.

If we want to discuss the confusion which exists in the energy-absorbing padding materials, it is not a bit different from the confusion which exists in the glazing field or the confusion which exists in what a door lock should or should not do.

I believe we have to come with industry participation and research, and people who are sincerely and honestly interested in the welfare of the motoring public, to a spot where we can then set up a set of criteria as minimums, and not shackle inventiveness nor production nor cost

solutions that might come at a later time, provided they do not let this protection for the public go below this plateau.

Mr. ROBERTS. I might say that is one reason that in H.R. 1341 my thought was that the Secretary of Commerce would be the ideal place, because that Department of Government is probably closer to industry than any other department of Cabinet level.

And having handled many of industry's problems and being conversant with the problems of industry, it is my feeling that the Secretary of Commerce would be an ideal place for this criteria to be decided upon.

Certainly, we have to have one place of authority in this whole picture. I want to thank you again for your testimony.

I have a statement from Mr. Russell I. Brown on H.R. 903. Mr. Brown is president of the Insurance Institute for Highway Safety, and this group is representative of three major segments of the automobile casualty insurance industry, which originally established the Insurance Institute for Highway Safety.

The members, that is, the segments of that institute, are the Association of Casualty & Insurance Companies, the National Association of Automotive Mutual Insurance Companies, and the National Association of Independent Insurers. This statement will be filed for the record.

(The statement of Mr. Russell I. Brown referred to follows:)

STATEMENT BY RUSSELL I. BROWN, MARCH 28, 1961

To: Committee on Interstate and Foreign Commerce, House of Representatives.
Subject: H.R. 903, a bill to require certain safety devices on motor vehicles sold, shipped, or used in interstate commerce, and for other purposes.

QUALIFICATIONS

My name is Russell I. Brown and since August of 1959 I have been president of the Insurance Institute for Highway Safety. This organization has one and only one objective—to reduce highway accidents. The three major segments of the automobile casualty insurance industry established the Insurance Institute for Highway Safety. They are the Association of Casualty & Surety Companies, the National Association of Automotive Mutual Insurance Companies, and the National Association of Independent Insurers. This action combines the highway safety efforts of these three associations and those of their more than 500 member companies which write about 80 percent of the Nation's automobile insurance.

Prior to my appointment as president of the Insurance Institute for Highway Safety, I was commissioner of public safety for the State of Iowa. As commissioner of this department I had the responsibility for the Iowa highway patrol, the driver's licensing and financial responsibility division, the accident records and statistics division, the motor vehicle registration division, the automobile dealers licensing division, the bureau of criminal investigation, the State safety education division, and the police radio communications.

My entire career has been in the field of traffic safety. Before becoming commissioner, I served as director of safety education for the Creston, Iowa, schools, was a staff member of the safety department of the Motor Club of Iowa, was a staff member of the school and college division of the National Safety Council, and was director of the safety education division in the Iowa Department of Public Safety. I received my master's degree from the Center for Safety Education at New York University.

Presently, I serve as a member of the board of directors of the National Safety Council and the advisory committee for the Center for Safety Education, New York University. I am a special consultant to the U.S. Public Health Service and am on the Advisory Committee for the President's Committee for Traffic Safety.

POSITION STATEMENT

My position here today is to oppose the enactment of H.R. 903.

My following remarks are directed primarily to the topic of speed control governors on motor vehicles, which is covered in H.R. 903. Twenty-nine States have established maximum speed limits by law. In all but one case these limits are set appreciably lower than 80 miles per hour. These limits have been determined on the advice of State officials based on engineering surveys which considered the following limitations:

- (a) The design of highways.
- (b) Limitations of automobiles.
- (c) Capabilities of drivers.

Relatively few miles of highway are constructed to permit a person to drive at rates of 80 miles per hour or over. We have yet to design a foolproof highway for any speed, because the driver and the vehicle are significant factors which help determine the safe speed.

The same situation exists with the automobile as does with the highway. No motor vehicle has yet been designed foolproof since the vehicle is controlled by the driver in relation to the existing highway conditions and the movement of traffic.

The driver is the most important element of these three since it is necessary for him to determine change of conditions of the road and the vehicle as well as changing conditions in the movement of traffic. His judgment and his ability to make these changes effectively is of prime importance.

The addition of a governor on a vehicle would limit the driver's ability to make these changes.

It is important to note that the 1960 Accident Facts, published by the National Safety Council, indicates on a statewide basis only 1 percent of the total number of accidents involved vehicles traveling in excess of 70 miles per hour. Since a large number of these drivers would be in the 71 to 80 miles per hour bracket, probably less than one-half of 1 percent would be driving over 80 miles per hour. This is an extremely small percent of drivers to use as a basis for requiring all drivers to invest in governors. It is conceivable that, if all cars were equipped with governors, the limitations and malfunctions of these governors may cause more accidents than are presently resulting from high speed.

Law enforcement records show that relatively few drivers are arrested at speeds higher than 80 miles per hour. I have worked with these violators and know that those exceeding 80 miles per hour have a definite intention to break the law for one reason or another. People with this attitude would most likely tamper with a governor if it was on their car and thus the governor would be ineffective as far as the group it was designed to control is concerned.

The proposed legislation, if enacted, would lead to a dangerous and unwarranted conclusion that the Federal Government approves speeds up to 80 miles per hour, "or to such top speed in excess of 80 miles per hour as the Secretary of Commerce deems it appropriate."

Most people in America are law-abiding citizens. They desire to comply with reasonable laws. The design of our highways, the volume of traffic, the inabilities of human beings, along with the availability of faster methods of travel, other than the automobile, all add up to the fact that driving 80 miles per hour is unsafe, unwarranted, unnecessary, and undesirable.

I find that considerable authority for approval of safety equipment on vehicles is currently vested with State authorities. I believe that States should be responsible to carry out this authority.

To reduce effectively traffic accidents on the highway, it is understood that a well-balanced, comprehensive traffic safety program is the approach. This is available in the action program of the President's Committee for Traffic Safety compiled under 10 specific sections. They are—

1. Accident records.
2. Education.
3. Engineering.
4. Uniform laws.
5. Motor vehicle administration.
6. Organized citizens' support.
7. Police enforcement.
8. Research.
9. Public information.
10. Traffic courts.

My remarks should not be interpreted as being opposed to building into automobiles as much safety as possible, but I am opposed to governors for reasons I have indicated. If legislation is to be enacted in order to reduce traffic accidents, it is recommended that it should be enacted by the States and designed to allow the States, the counties, and the municipalities to implement this action program of the President's Committee for Traffic Safety, now being printed by the Government Printing Office.

Mr. ROBERTS. The record will be left open for statements by various witnesses who requested that authority.

The subcommittee will stand in recess subject to the call of the Chair.

(Whereupon, at 3:35 p.m., the subcommittee was adjourned, subject to the call of the Chair.)

MOTOR VEHICLE SAFETY STANDARDS

FRIDAY, APRIL 14, 1961

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY OF THE
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts (chairman of the subcommittee) presiding.

Present: Representative Roberts, Rogers of Florida, Nelsen, and Thomson.

Mr. ROBERTS. The subcommittee will please be in order.

We will at this time recess the subcommittee so that the members of the subcommittee and any other interested parties may view an automobile owned by Mr. C. W. Heppenstall of Delray Beach, Fla.; and then we will return here and hear the industry with reference to the tempered versus laminated glass problem.

So, at this time we will stand in recess for about 15 minutes.

(Short recess taken.)

Mr. ROBERTS. The subcommittee will please be in order.

The Subcommittee on Health and Safety is meeting this morning to continue hearings on H.R. 903 and H.R. 1341 to provide standards for passenger-carrying motor vehicles.

We have public witnesses scheduled for this morning.

Monday morning we are to hear the representatives of the Department of Commerce, Department of Health, Education, and Welfare, and of the General Services Administration.

I might also mention that we may be able to continue the hearing in the afternoon for other witnesses who would like to be heard.

Tuesday we will hear a witness from the Department of Defense, and witnesses from the Bureau of Motor Carriers of the Interstate Commerce Commission.

I think in view of the fact that the hearing on the part of the industry is going to be quite long, I understand Mr. Heppenstall of Heppenstall Industries of Delray Beach, Fla., has a very short statement, and I would like to take him at this time, and then we can go ahead with you.

How long is your statement, Mr. Heppenstall?

Mr. HEPPENSTALL. Mr. Chairman, first, thank you for looking at the car for considering the safety features in it that have been included.

I have prepared a presentation, and if I could just hand it to you for distribution to the members, I think that would—

Mr. ROBERTS. That will be all right, sir.

**STATEMENT OF C. W. HEPPENSTALL, HEPPENSTALL INDUSTRIES,
DELRAY BEACH, FLA.**

Mr. HEPPENSTALL. If it is suitable to you, I would simply like to read from this the main items, and the explanations, I believe, were included in the written writeup.

Mr. ROBERTS. All right, sir.

Mr. HEPPENSTALL. The following safety features are incorporated in several standard automobiles which have been modified by Heppenstall and which are now identified as—

SAF-T-KAR

1. Seat belts (2 front, 2 rear).
2. Bayonet type door locks. (All door locks on standard cars are unsafe.)
3. Rollover bar. (All stock racing cars are provided with rollover bars—provide in roof construction on new production cars.)
4. Padded dash on front of right front seat. (Present padded dashboards in standard cars are a travesty.)
5. Saf-T-Turn and emergency signal system. (Driver in the rear, driver abreast, and driver approaching in the front can see and identify signal. Amber lenses are used front and back.)
6. Rear view mirrors. (Much better rear vision and side vision are obtained than that provided in standard cars.)
7. Adjustable governor. (Governor is set for 65 miles per hour for Florida driving.)
8. Auxiliary hand-operated throttle.
9. All external dangerous ornaments are removed.

The following additional safety features are recommended for future production cars:

1. Two-headlight system. (The present four-headlight system is a hazard when passing lights are not used.)
2. Uniform drum type speedometer. (Present varieties of speedometers are difficult to read.)
3. Well lighted odometer figures at least one-half inch high.
4. Padded rear of front seats, padded interior side walls, and padded roof interior. (No ashtrays, handles, or ornaments.)
5. On two-door models, provide means of holding front seats in place.
6. Real bumper systems, incorporating rubber. (Many present bumpers are ornaments.)
7. Provide real holddown in frame so that engine will not easily be moved to the rear in case of bad impact.
8. Use real safety glass in all glass areas (laminated glass and plastic.)
9. Remove all door handles and window-operating handles from side area. (Use recessed handles or recessed pushbuttons.)

If there are any questions about any of these items I would be glad to try to answer.

Mr. ROBERTS. Well, first of all, the Chair would like to thank you for coming here, Mr. Heppenstall, and for your interest in safety and for bringing the Saf-T-Kar to the attention of the committee.

I would like to know a little bit about your training and how you became interested in the various safety features which you incorporated on your Saf-T-Kar.

Mr. HEPPENSTALL. Well, today I make my living as an inventor and as a promoter, but in the past I have been an engineer and in manufacturing, operating portions of industry in the aluminum and in the steel and forging industry.

Mr. ROBERTS. How long have you had the Saf-T-Kar?

Mr. HEPPENSTALL. Well, the first one was modified in 1956, and it has been sort of like Topsy; it has grown from a few things to some additional items.

Mr. ROBERTS. Do you have any figures as to the cost of the individual items which you presented in your statement?

Mr. HEPPENSTALL. No, sir; I do not. But I think it would be difficult for anyone outside of the automobile industry to arrive at engineering and development costs. But I am relatively certain that once those costs are out of the road, not one of these items would be very expensive.

Mr. ROBERTS. That is all I have.

Mr. ROGERS.

Mr. ROGERS of Florida. Thank you, Mr. Chairman.

Of course, I am delighted that Mr. Heppenstall has an interest in this subject and, particularly, being from my area. I appreciate his coming up and giving the committee the benefit of a look at some of his suggestions about safety in the automobile field.

From my understanding, do you feel that it would be wise for the industry itself to make a prototype Saf-T-Kar?

Mr. HEPPENSTALL. An effort has been made and contacts have been made with all of the major automobile manufacturers to make one model that incorporates these safety features.

Now, there have been studies made that would indicate that at least one-half of the fatal accidents would be taken from our yearly total which, last year, was about 38,000, if just the features that are on the car now were included.

Mr. ROGERS of Florida. I see. I was interested in your safety turn and the emergency signal system. You have all four of the indicators on the car where they can be seen easily. They are located in a high position on the fenders. Also, I believe, they are yellow or caution lights rather than the red, which makes a difference. You pay more attention to them.

As I understand it, if you were to stop on the highway those lights would flash?

Mr. HEPPENSTALL. A separate switch would operate all four lights, and all four lights would flash.

Mr. ROGERS of Florida. I see.

Well, I certainly commend you for your interest in this field, and it has been most helpful to the committee.

Mr. HEPPENSTALL. If we get a few automobiles made, it will be well worth the while.

Mr. ROGERS of Florida. Thank you.

Mr. HEPPENSTALL. Thank you.

Mr. ROBERTS. Thank you very much, Mr. Heppenstall.

The next witness is Mr. Karl M. Richards.

Mr. Richards is manager of the Field Services Department of the Automobile Manufacturers Association, Inc., 1710 H Street NW., Washington 6, D.C.

He is accompanied by Dr. Joseph D. Ryan, director of research and development, Libby-Owens-Ford Glass Co.; Mr. Larry Keim, manager of technical services, auto sales, Glass Division, Pittsburgh Plate Glass Co.; and Mr. Ormond I. Rugg, glass engineer, Glass Division, Ford Motor Co.

Before Mr. Richards testifies, I would like to have incorporated in the record some documents at this time, if there is not objection on the part of the members of the subcommittee.

I have, first of all, a letter from Mr. Harry A. Sieben, director of Highway Safety Division of the State of Minnesota, which letter is dated April 11, 1961; together with a resolution of the Minnesota Legislature memorializing the President and the Congress of the United States to provide for safety standards, or for safe standards, of automobile vehicle design and safety devices and the enforcement of such standards in the automotive industry. This resolution is numbered Resolution No. 21.

I also have a statement supporting this resolution on traffic safety by Hon. Orville L. Freeman, who is now Secretary of the Department of Agriculture, former Governor of the State of Minnesota; together with the proposed resolution on traffic safety for action by the Governors' conference, also attended by Governor Freeman.

So, without objection, these documents will be incorporated in the record.

(The documents referred to follow:)

STATE OF MINNESOTA,
DEPARTMENT OF HIGHWAYS,
St. Paul, Minn., April 11, 1961.

HON. KENNETH A. ROBERTS,
*Committee on Interstate and Foreign Commerce,
House Office Building, Washington, D.C.:*

DEAR CONGRESSMAN ROBERTS: On March 24 I sent a telegram to you advising that the Minnesota Legislature had adopted a resolution memorializing the President and the Congress of the United States to provide for safe standards of automobile vehicle design and safety devices and for the enforcement of such standards in the automotive industry. I also urged that your committee take action and not be misled by organizations purporting to represent State administrators. I am attaching a copy of this telegram for your file. In addition I am attaching a photostatic copy of the resolution passed by our legislature and approved by Gov. Elmer L. Andersen.

I feel very strongly that many of the injuries and deaths that we suffer on our streets and highways could be prevented through the use of certain safety devices and automobile design features, such as safety belts, padded dashboards, and recessed cranks, knobs, handles, and other projections in the vehicle.

It is also my strong personal feeling after working in this area for many years, that advancement in this area can only come about as the result of Federal legislation. During the past 4 years I had the honor to work under the direction of our former Minnesota Governor, Orville L. Freeman, who is now Secretary of the Department of Agriculture. Governor Freeman felt very strongly about this matter and made several statements while he was Governor to support Federal legislation to accomplish these ends.

For the information of your committee I am attaching a copy of the statement which Governor Freeman made at the Governors conference in 1960 on this subject. It is one of the finest, most comprehensive and best documented reports that I have seen. I hope that it might be helpful in your committee's consideration of the many safety bills which are now before you.

Yours very truly,

HARRY A. SIEBEN,
Director, Highway Safety Division.

S.F. No. 604, RESOLUTION No. 21

A RESOLUTION MEMORIALIZING THE PRESIDENT AND THE CONGRESS OF THE UNITED STATES TO PROVIDE FOR SAFE STANDARDS OF AUTOMOBILE VEHICLE DESIGN AND SAFETY DEVICES AND THE ENFORCEMENT OF SUCH STANDARDS IN THE AUTOMOTIVE INDUSTRY

Whereas $1\frac{1}{2}$ million Americans are killed or injured in motor vehicle crashes annually; and

Whereas various research projects have proven that a major part of these deaths and injuries could have been prevented by proper vehicle design standards and safety devices for automobiles; and

Whereas the motor vehicle is the subject of and the instrument of interstate commerce and therefore the proper subject of Federal regulation: Now, therefore, be it

Resolved by the Legislature of the State of Minnesota, That the President of the United States and the Congress of the United States be requested to enact such legislation as may be necessary to provide for safety standards for automotive vehicle design and safety devices and for the enforcement of such standards in the automotive industry; and be it further

Resolved, That the secretary of state of the State of Minnesota be instructed to transmit copies of this resolution to the President of the United States and to each Member of Congress from the State of Minnesota.

KARL ROLVAAG,
President of the Senate.

E. J. CHILGREN,

Speaker of the House of Representatives.

Passed the Senate this twenty-fourth day of February in the year of Our Lord one thousand nine hundred and sixty-one.

H. Y. TORREY,

Secretary of the Senate.

Passed the House of Representatives this first day of March in the year of Our Lord one thousand nine hundred and sixty-one.

G. H. LEAHY,

Chief Clerk, House of Representatives.

Approved March 9, 1961.

ELMER L. ANDERSEN,

Governor of the State of Minnesota.

Filed March 9, 1961.

JOSEPH L. DONOVAN,

Secretary of the State of Minnesota.

PROPOSED RESOLUTION ON TRAFFIC SAFETY FOR ACTION BY THE GOVERNORS CONFERENCE, PRESENTED BY ORVILLE L. FREEMAN, GOVERNOR OF MINNESOTA

Whereas human suffering and economic loss resulting from traffic accidents has been increasing each year, with forecasts that this suffering and loss will increase at an accelerated rate as the numbers of vehicles and drivers increase; and

Whereas research and study have demonstrated that certain safety devices and design features, which can be installed or incorporated in the vehicles at a relatively small cost at the time of manufacture, can produce a substantial reduction in the number and severity of injuries sustained in traffic accidents; and

Whereas the automobile manufacturers for the most part have not chosen to incorporate the safety devices or design features as standard equipment in their products despite the evidence which shows that by so doing they would save lives and prevent injuries; and

Whereas protecting the health and welfare of consumers has long been a field of official concern leading to appropriate legal regulation in such fields as the manufacture, shipment and use of drugs and foodstuffs, as well as in the fields of zoning, fire prevention, public health and in transportation by public carriers; and

Whereas the motor vehicle is the cargo in and the vehicle of interstate transportation and as such the regulation of its manufacture requiring that it meet minimum standards with regard to safety devices and safe design features should be carried out by the Federal Government of the United States; and

Whereas an act to require passenger-carrying motor vehicles purchased by the Federal Government to meet certain safety standards to be established by the Secretary of Commerce has been passed by the House of Representatives in the 86th Congress and is now being considered by the Committee on Interstate and Foreign Commerce of the Senate of the United States; and

Whereas the enactment of such legislation would be a step toward acquiring adequate Federal control requiring all automobiles made in the United States to meet certain safety standards: Now, therefore, be it

Resolved by the Conference of Governors in session, That this conference endorse and support Federal legislation requiring passenger-carrying motor vehicles purchased by the Federal Government to meet certain safety standards to be established by the Secretary of Commerce; and now, therefore, be it further

Resolved by the Conference of Governors in session, That this conference urge the introduction and support the enactment of such Federal legislation as is necessary to protect our citizens from injury and death in traffic accidents by empowering the appropriate Federal authority to prescribe and enforce the installation of proven, practical safety features in every passenger-carrying motor vehicle shipped in or used in interstate commerce.

A STATEMENT IN SUPPORT OF THE PROPOSED RESOLUTION ON TRAFFIC SAFETY BY
ORVILLE L. FREEMAN, GOVERNOR OF MINNESOTA

Many leading medical authorities have described the increasing number of injuries and deaths on the Nation's streets and highways as a health problem which has reached epidemic proportions.

Just as the solution to an epidemic disease involves two major approaches, the removal of the causal factor and the elimination of the symptoms, the solution of our traffic injury problem involves the elimination of the causal factor, which is the accident itself, and the elimination of the resultant injuries.

Of course our ultimate objective is to eliminate the accidents through highway engineering, education of our drivers, and enforcement directed at eliminating traffic law violations.

However, we all recognize that to effect a decrease in the number of accidents will take a long time, and it is doubtful if we will ever eliminate all traffic accidents as long as automobiles are our major form of transportation. But we can immediately eliminate many of the injuries and deaths and much of the human suffering resulting from accidents. This can be accomplished by utilizing the knowledge we now have about the effectiveness of certain safety devices and automobile design features such as safety belts, padded dashboards, recessed cranks, knobs, and handles. Some of these injury producing projections were placed on the car for no greater purpose than ornamentation.

Tests conducted by Cornell University and others have demonstrated that the design of the vehicle and the use of safety devices directed at producing a safe package for the occupants of a vehicle will decrease substantially the number and severity of injuries when accidents occur.

The automobile contains the most precious cargo of all packages designed today to carry any object from one place to another, yet it provides less protection for its contents than a crate used to ship easily damaged automobile components.

There are mountainous files of official police reports on traffic accidents which indicate that injuries, often fatal, have resulted not from the impact of the collision but from failure of the vehicle to protect the occupant.

Yet, the automobile manufacturer has shown a reluctance to install safety improvements which both medical and engineering research has found to be sound and practical.

This safety problem has had the serious attention for years of respected medical and engineering researchers. Their studies demonstrate that injuries could be reduced by as much as 50 percent by providing the ingredients of a safe "package."

This research has been made available to automotive designers and manufacturers. Therefore, the responsibility for many of the deaths and injuries occurring on America's highways must be charged against those manufacturers who put profit and sales before the health and safety of their customers.

The fully documented research, based on empirical data, gives proof that the integration of recommended safety devices and features into modern vehicle design could be done with little or no additional cost or harm to design appeal.

The American Medical Association has been in the forefront of the advocates of safer design principles in the automobile. The research conducted under medical auspices has led the AMA to warn that motor vehicle injuries have reached epidemic proportions.

The AMA Journal¹ for January 1958 was almost wholly devoted to reporting the results of these independent studies. In general, the authors recognized that most traffic accidents result from errors on the part of the driver; but too high a percentage of injuries resulted from errors of manufacture.

The editorial of that edition, entitled "Death on the Highways," states:

"Fundamental standard equipment should be designed in full recognition of the fact that every car may be involved, quite innocently, in a serious crash or rollover."²

One article described the report three doctors had made to the annual meeting of the AMA. As a result of their study, they had recommended a number of tested automotive improvements that "would definitely lower the mortality and injury rates in serious auto accidents."³ They listed these safety features:

Better rollover frames to prevent collapse of tops in accidents.

Seat belts of good quality, properly attached.

Safety door latches to prevent doors from opening.

Padding of dashboards with shock-absorbing materials.

Restraining mechanisms for backs of all folding seats.

Elimination of projecting items both inside and outside the vehicle.

Shock-absorbing steering wheels and folding steering columns.

It is significant that these medical men stated that safety seat belts would probably save more lives and limbs than any other single item; and that if doors stay closed in high-speed accidents, serious injury is frequently prevented.⁴

"If the passengers had been strapped to their seats, and not thrown out through open doors or against the dashboard, they could have been saved."⁵

Perhaps the most extensive research into the question of causes of injury in accidents is being conducted at Cornell University Medical School. Dr. John Moore, study director, reported that automobile design can prevent killing and maiming caused by steering and post assembly, ejection, instrument panels, windshield, back of the front seat, doors, front corner post, flying glass, top or roof, and the rearview mirrors. These danger areas are listed in their order of injury causation.⁶

Engineering research has shown that these hazards can be corrected to alleviate the dangers inherent to present design without additional cost—if made at the time of manufacture of the vehicle.

Boris Tourin,⁷ of the Cornell project has found there is a direct relationship of automobile design to injury in the comparison of the frequency of fatality among ejected and nonejected occupants. He indicates that 25 percent of all fatalities among passenger car occupants can be eliminated if ejection is completely prevented. This would be accomplished by the installation and use of proper safety belts, instrument panel padding, and door latches which remain operative at all speeds.

Further, under controlled laboratory conditions, safety belt restraining actions have reduced the force of head blows by as much as one-third. With the use of energy-absorbing materials in the areas where passenger heads can strike, a further decrease of about 60 percent in risk of all grades of injuries could result.⁸

¹ The Journal of the American Medical Association. CLXIII, No. 4, January 1957.

² Ibid., p. 262.

³ Murray E. Gibbons, William V. Smith, and Ward B. Studt, "The Doctor and the Automobile Accident." The Journal of the American Medical Association, January 1957, p. 255.

⁴ Ibid., pp. 256-257.

⁵ U.S. Congress, House, "Traffic Safety," hearing before Subcommittee on Interstate and Foreign Commerce, U.S. House of Representatives, 84th Cong., 2d sess., on H. Res. 357, Aug. 29, 1956 (Washington, Government Printing Office, 1957), p. 515.

⁶ Mr. Tourin is chief of the technical section of automotive crash injury research, a division of the department of public health and preventive medicine, Cornell University Medical College, New York City.

⁷ Ibid., p. 258.

⁸ Boris Tourin, "Ejection and Automobile Fatalities," Public Health Reports, Public Health Service, U.S. Department of Health, Education, and Welfare, LXXIII, No. 5, p. 387.

An independent project of the Colorado State Medical Society and the Denver Police Department also demonstrated that designing the automobile for safety would greatly reduce deaths and injuries. Under the direction of the society's automotive safety committee, Dr. Horace E. Campbell demonstrated with his "Operation Egg Drop" that the human head could be protected from dangerous and fatal injuries in automobile crashes. This would be accomplished by the placement of proper padding material on those spots where serious blows often occur such as the instrument panel, windshield header, and the forepart of the roof. The study was undertaken because many members of the society were convinced that injury prevention is equally important with, and probably more easily achieved than, accident prevention.⁹

Safe design of automotive equipment has been a special field of interest for Prof. James J. Ryan of the University of Minnesota. He has determined that a series of design changes involving adequate packaging would prevent injury to passengers in collisions—without change in styling or increase in cost of new automobiles.¹⁰

He recommends the adoption of hydraulic bumpers, collapsible steering wheel and post assembly, recessed dashboards and seat belts. Ryan has testified before the U.S. House of Representatives Subcommittee on Health and Safety that the engineering knowledge is available to lawmakers for legal definition of a safe car-passenger environment.¹¹

The percentage of lives saved or injuries prevented as a result of improved "packaging" varies from study to study, but all indicate there would be substantial savings. Dr. C. Hunter Sheldon claims that 75 percent of the fatalities resulting from automobile accidents could be prevented by following safety design features as proposed by Professor Ryan; and that 25 to 35 percent of crash fatalities could be prevented if occupants could be kept within the vehicle.¹² Dr. John O. Moore stated that, "Injuries in military aviation crashes dropped approximately 500 percent because of application of (safety engineering) data in the development of the proper kind of packaging for air crews."¹³ Lt. Col. John P. Stapp has suggested that lap-type seat belts would prevent 21 percent of the death and serious injuries in automobile accidents.¹⁴

The Department of Health, Education, and Welfare, on the order of Surgeon General Leroy Burney, adopted seat belts in its 500-car fleet. Burney stated that major injuries could be reduced 30 percent by adopting this safety feature.¹⁵

In my own State of Minnesota I have issued an executive order requiring all State-owned vehicles to be equipped with safety belts. In the 3 years that this order has been in effect there have been many serious accidents where our employees attribute their being alive today to the use of these safety belts.

There is now before the U.S. Congress a bill (H.R. 1341) which would require that all passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards to be established by the Secretary of Commerce. This legislation has been passed by the House of Representatives and is now before the Senate Committee on Interstate and Foreign Commerce. In a resolution which I propose to introduce to the annual Governors' conference I ask that the conference support this legislation because it would encourage the adoption of such standards for all motor vehicles sold to the people of our country.

In addition, the resolution urges the 1960 Governors' conference to support the introduction and enactment of Federal legislation empowering the appropriate Federal agency to prescribe and enforce the installation of proven, practical safety features in every passenger-carrying motor vehicle shipped in or used in interstate commerce.

⁹ Joseph N. Bell, "One Man's Fight for Safer Cars," *Today's Health*, XXXVII, No. 4, April 1959, p. 22.

¹⁰ James J. Ryan, testimony to Subcommittee of Interstate and Foreign Commerce, U.S. House of Representatives, 85th Cong., 1st sess., on H. Res. 1341, July 9, 1959.

¹¹ *Ibid.*

¹² Journal of the American Medical Association, Nov. 5, 1955, as quoted by Senator Paul Douglas, Traffic Safety hearing before a Subcommittee on Interstate and Foreign Commerce, U.S. House of Representatives, 84th Cong., 2d sess., on H. Res. 357, July 16, 1956 (Washington: Government Printing Office, 1957), p. 6.

¹³ Report to the public on the National Safety Forum, September 1955, as quoted by Senator Paul Douglas, Traffic Safety, hearing before Subcommittee on Interstate and Foreign Commerce, U.S. House of Representatives, 84th Cong., 2d sess., on H. Res. 357, July 16, 1956 (Washington: Government Printing Office, 1957), p. 21.

¹⁴ *Ibid.*, p. 18.

¹⁵ Uncle Sam Endorses Seat Belts, *Traffic Safety*, May 1959, p. 13.

The proposals would not open a new field for Government. For years Federal agencies have provided standards of design, materials, sanitation, and other protections for public safety. Congress has created, as well, the enforcement agencies to effect those safeguards. For example, the control of those who fly our civil aircraft lies within a Federal agency; but even further, this Agency controls the aircraft itself from its original design through its materials selection and manufacture on a continued inspection basis.

The Food and Drug Administration is one of our most respected agencies at the Federal level because it fulfills the important mission of protecting the consumer from those products which are harmful and injurious to his health.

At present, the Interstate Commerce Commission has authority to prescribe basic safety design features for trucks, buses, and trains used in interstate commerce. They now require safe design standards for trucks carrying dangerous cargo and have established standards for distortion-free windows on trains and buses as well as regulations on lighting, wiring, brakes, and emergency equipment. Is there any reason why regulations of a similar nature should not be established to protect the user of a passenger car?

Of course, such would not be necessary if the automobile builders would utilize the results of accident research voluntarily. However, many of the vehicle manufacturers have exhibited a deplorable indifference toward the safety of their customers.

At the 1959 Governors' conference I proposed a resolution similar to the one I will introduce this year, asking the conference to endorse Federal controls requiring automobile manufacturers to produce vehicles which would meet certain safety standards. At that time, it was suggested that we wait for another year to see if the manufacturers would comply voluntarily.

The extent to which the manufacturers have adopted these devices is revealed in a study conducted by one of Minnesota's largest insurance organizations, the St. Paul Western Insurance Cos. The study was directed at determining "whether or not the present design and construction of private passenger cars contributes to the seriousness of the injuries to occupants and/or others involved in accidents."¹⁰ The following are excerpts from the conclusions drawn by this study:

"It is hoped that the tabulations and summaries of source material will be useful in helping to solve the problems of traffic accidents in this State. However, a look at most 1960 models should bear out the contention that manufacturers have paid little heed to the published results of studies in the field of safe vehicle design and proven safety accessories. A great majority have in common the following:

"Excess glass, with resulting reduction of members supporting the roof, more sun glare and heat to occupants front and rear. In some, the upper frame of the rear window is directly over the heads of rear seat passengers.

"Seats too close to the floor force extension of the legs into tiring extended conditions, causing driver fatigue that enhances the chances of an accident. They also limit visibility of the roadway directly ahead of the car, and often put the upper portion of the wheel rim directly in the driver's line of vision.

"Bumpers offering little protection or ability to absorb shock, with front and rear body projections extended almost as far as the bumpers themselves.

"Such designs as 'integrated bodies' and 'X-frames' discard the protection to occupants afforded by the heavy side frame members of older cars.

"Such proven safety accessories as seat belts, padded dash, visor and front seat backs, and collapsible steering column are available only as additions at extra cost."

An article in the June 1960 edition of *Better Homes and Gardens* which describes the Harvard Medical School's research on fatal collisions project, points out that, "In the total safety picture, manufacturers have made little but a token gesture."

The researchers, medical doctors, engineers, and other scientists, have become concerned with the indifference displayed by the manufacturers to the life-saving potential of their recommendations.

The authors of the Harvard project have been so concerned by this situation that they have included legislation in their program.

¹⁰ R. M. Hubbs, "Report on St. Paul Fire & Marine Insurance Co. Automobile Vehicle and Equipment Research Study of January 1960." Prepared by the St. Paul Fire & Marine Insurance Co., St. Paul, Minn.

¹¹ Lawrence Lader, "Death by Driving." *Better Homes and Gardens*, June 1960, p. 60.

The final objective of the Harvard collision project is to translate medical and scientific research, not only its own but the results of other studies, into legislative action. New laws and administrative procedures at both the Federal and State levels are essential in stamping out the disease of highway deaths.¹⁸

The epidemic of injuries and deaths in traffic is of national concern. It affects a million and a half persons annually. If the requirements for public safety to combat this epidemic are to be fulfilled, a Federal law setting the standards for a safe vehicle package must be adopted by Congress.

This law should give the Department of Commerce discretionary powers to require that motor vehicles be designed and produced with the safety features necessary to protect the consumer from death and injury in automobile accidents. It should provide that each vehicle must be so equipped before entry into interstate commerce.

The agency needed to carry out the provisions of such a law, as well as the precedents needed to establish the procedures and enforcement, are in existence. Only the legislation is needed. This need exists now and becomes of greater importance as the number of vehicles increases.

Mr. ROBERTS. Now, Mr. Richards, you may proceed with your statement.

STATEMENT OF KARL M. RICHARDS, MANAGER, FIELD SERVICES DEPARTMENT, AUTOMOBILE MANUFACTURERS ASSOCIATION, INC.; ACCOMPANIED BY JOSEPH D. RYAN, DIRECTOR OF RESEARCH AND DEVELOPMENT, LIBBY-OWENS-FORD GLASS CO.; LARRY KEIM, MANAGER, TECHNICAL SERVICES, AUTOMOTIVE SALES, GLASS DIVISION, PITTSBURGH PLATE GLASS CO.; ORMOND I. RUGG, GLASS ENGINEER, GLASS DIVISION, FORD MOTOR CO.; AND HOWARD K. GANDELOT, ENGINEER IN CHARGE, VEHICLE SAFETY SECTION, GENERAL MOTORS ENGINEERING STAFF

Mr. RICHARDS. Chairman Roberts and members of the committee, you have been asked to amend H.R. 903 to require the use in motor vehicles of laminated safety glass forward of seated passengers. We appreciate the opportunity to present the pertinent facts in opposition of this proposal.

We realize that your schedule is overcrowded and we, therefore, will make our presentation as brief as possible, and in order to give you a complete picture. But if more details are desired, we can either furnish them in answer to our questions or we can file supplementary material, as you may wish.

Now, there are two phases to this matter before you: In addition to the technical and safety aspects there are the economic considerations, and these are most important to understand the problem that is before you.

Both laminated and solid tempered safety glass are now being used by all U.S. motor vehicle manufacturers as provided in the American Standards Code for Safety Glazing Materials.

Laminated safety glass is used exclusively in windshields and tempered safety glass is used exclusively in rear windows. In the side openings both types of safety glass have been used extensively for many years. Over the years the manufacturers have gradually increased the use of tempered safety glass in the side openings until today practically all side openings are glazed with tempered safety glass.

¹⁸ Ibid., p. 146.

This has created an economic problem for the glass replacement industry which is best explained by the following excerpt from a letter sent out by the Shatterproof Glass Co. of Detroit, a manufacturer of laminated safety glass for the replacement trade.

I quote from this letter which was broadcast to glass dealers with a tempered or "casehardened" glass demonstration kit.

*** This letter is important to you and your business because if all cars were completely equipped with tempered or casehardened glass there would be practically no replacement business.

For this reason, and because safety is your business, the fight against the use of casehardened glass is your fight.

This is a correct statement. The use of tempered safety glass has reduced the auto glass replacement business.

In the September 1960 edition of Glass Digest, volume 39, No. 9, a report entitled "Shrinking Auto Glass Replacement Market Forecast" indicates that by 1970 nearly four out of five cars on the road will have tempered sidelights. The report predicts that the laminated safety glass replacement in sidelights in 1970 will only be 44.2 percent of the 1959 total sidelight replacement business despite the expected increase in vehicle registrations, and, I might add, that we anticipate about 100 million motor vehicles registered by 1970.

PUBLIC SAVINGS

When tempered safety glass was first introduced for automotive use in 1935 its cost was higher than laminated safety glass. Today due to improved manufacturing techniques and volume production of this safety glass the cost is slightly less than that of laminated safety glass. Thus, there is an initial saving in the original equipment use of tempered safety glass in the side openings of new motor vehicles.

Of more significance, however, is the subsequent savings to car owners in maintenance and replacement costs. Due to the strength and durability of tempered safety glass, the breakage and replacement of such glass is from one-fourth to one-tenth of the breakage and replacement of laminated safety glass in the side openings.

Now, of more importance is the technical and safety aspects.

All of the above economic advantages would be unimportant if public safety were being sacrificed. There has been no compromise with safety. The public interests are fully protected through the American Standards Code for Safety Glazing Materials. Furthermore, the motor vehicle manufacturers' selection of approved safety glazing material is based on vast field experience with tempered safety glass in the United States, Canada, and Europe. This experience has been supplemented by extensive research and laboratory testing and studies by independent agencies.

Dr. Joseph D. Ryan, director of research and development, Libbey-Owens-Ford Glass Co., will give you a very brief statement on the code. Dr. Ryan has been associated with this code since its inception. He has been active in the glass industry for over 30 years. He is a registered professional engineer and a member of:

1. American Chemical Society.
2. American Ceramic Society.
3. American Association for the Advancement of Science.

4. Society of Plastic Engineers.
5. American Society for Testing Materials.
6. Society of Automotive Engineers.

Dr. Ryan.

Dr. RYAN. Members of the committee, prior to the late twenties, ordinary annealed flat glass was used for glazing automotive vehicles. At that time safety glass started to replace this hazardous product which on rupture broke into many large, and small fragments having razorlike cutting edges.

The development of safety glass and its early adoption by the automobile industry was followed by the enactment of State laws making its use mandatory. Obviously, a technical standard for safety glass became a crying need and especially so if a national yardstick was to be achieved.

While some work in this area was carried out by the Society of Automotive Engineers, the public interest and involvement could best be served by the creation of a standard code through the American Standards Association. Accordingly, very early in the thirties a committee was selected to formulate a standard code with its membership comprised of over 20 different organizations, including Federal Government agencies such as the Interstate Commerce Commission, the Department of the Navy, and, as an active sponsor, the National Bureau of Standards.

Other organizations such as the National Safety Council and the American Association of Motor Vehicle Administrators participated in drafting the Safety Glass Code which became a tentative standard in 1935 and a full standard in 1938. In short, the people who drafted this ASA Safety Glass Code represented an excellent cross section of the best talent available in the automotive, glass, and plastic industries combined with people of equal capabilities from organizations dedicated to the public interest.

The ASA Code is a living document. Under ASA rules and procedures, this code must be and has been periodically reviewed to reflect technological as well as social changes. Therefore, the code committee reviewed and once reaffirmed the 1938 version, but in the late 1940's decided a revision must be considered. This decision stemmed from the fact that numerous technological changes occurred in the interim.

Naming only a few, these were: (1) development of improved safety glass interlayers, (2) the introduction of curved windshields for better vision, (3) the development of heat-absorbing glasses, and (4) the suitability of certain plastics for glazing automobiles. Years of study and investigation by the committee led to the promulgation of the present version of the ASA Code dated 1950.

In 1955 the code was again reviewed and unanimously reaffirmed.

In 1959, when again asked for a review, the committee voted 25 to 8 for its reaffirmation. Consideration of this vote by the ASA Standards Board led to a decision on their part that a consensus had not been reached. Under standard ASA procedures the committee was reactivated to prove or disprove the allegations made by those voting against reaffirmation. To accomplish this reconciliation of views, a

technical committee was created which in turn appointed six task forces to study and investigate the following broad glazing areas:

- I. Injury areas in a vehicle.
- II. Fracture characteristics of glazing materials on impact.
- III. Visibility properties of glazing materials.
- IV. Energy absorption of glazing materials.
- V. Egress.
- VI. Durability of glazings.

Serving as members of these task forces is broad representative from all organizations of the main committee—special weight being given to insure that those opposing reaffirmation of the present standard are adequately represented. Programs of study unanimously agreed upon are on the agenda for investigation. If the outcome of these studies justifies or proves the allegations of the negative voters, the code will undergo change.

At the present time we have a good and adequate standard which has stood the test of time and which has been flexible enough to reflect both past and future scientific and social developments. In 1960 all of the ASA Code Committee acknowledged unanimously (including those voting against reaffirmation) that the present code is in full force and effect pending investigations which may or may not prove necessity for revision.

Suffice it to say that when the ASA Code was adopted in 1935 tempered safety glass and laminated safety glass were both approved glazing materials and their use was permitted from that time up to the present date—laminated glass for use in any location in a vehicle and tempered glass for all areas except the windshield. To make a change now without the careful scientific considerations and evaluations practiced in the past seems unwise.

In closing I might state that much has been made by some of the fact that the ASA Code does not require the same tests for tempered and laminated safety glasses employing these testing tools which I have before me now: Here is the half-pound steel ball, one implement, the 7-ounce steel dart, and the 11-pound shotbag. Actually, it is unusual scientifically to test dissimilar materials in the same manner. The tests for laminated safety glass are designed to bring out the safety properties in which that product excels and the tests for tempered safety glass, those in which that product excels.

Thank you very much.

Mr. RICHARDS. Dr. Ryan has referred to the tests for each type of safety glass material as provided in the code. It is a simple matter to slant a demonstration by applying the tests for one type of safety glazing material to another type for which the tests were not intended. Many well meaning, sincere people have been misled by such demonstrations.

Mr. Larry Keim, manager, Technical Service, Automotive Sales, Glass Division, Pittsburgh Plate Glass Co., will demonstrate this point. Mr. Keim has been with Pittsburgh Plate Glass Co. for 25 years in research, development, and technical service. He is a member of: American Chemical Society, American Ceramic Society, American Society for Testing Materials, and Society of Automotive Engineers.

Mr. Keim.

Mr. KEIM. Gentlemen, the statement is made in the American Standard Safety Code for Safety Glazing Materials that—

no one type of safety glazing material can be shown to possess the maximum degree of safety under all conditions, against all conceivable hazards.

Under the ASA Safety Code requirements, both types of safety glass are subjected to tests designed to insure that they are well made; so that they will deliver the maximum possible protection to car occupants against those accident hazards most likely to be encountered in service, in the areas in which their use is permitted.

It is necessary to consider all of the tests prescribed in the ASA Code and consider the reasons for the tests and the results on the various types of glass in order to have an overall view and to avoid looking at only certain aspects and results, which might tend to make one product look superior to another.

For example, the test requirements of the ASA Safety Code are such as to require laminated safety glass in windshields. This in effect recognizes the possibility of flying stones hitting the windshield (with consequent breakage and obscured vision if it were tempered glass) as being much more likely than that of a pheasant or chicken hitting a windshield.

However, a demonstration can be made, using this 11-pound shot bag as our pheasant, and I will drop it.

Mr. THOMSON. That is a big pheasant.

Mr. KEIM. I will drop the shot bag on a piece of tempered safety glass.

Mr. THOMSON. What kind of glass are you using?

Mr. KEIM. That is solid tempered safety glass.

Mr. ROGERS of Florida. Tempered.

Mr. KEIM. Now we can make the same test with the same pheasant on a piece of laminated safety glass.

Mr. ROGERS of Florida. How do you tell offhand whether it is tempered or laminated?

Mr. KEIM. Well, the laminated has the interlayer of plastic. It is a sandwich, and you can see readily.

Mr. ROGERS of Florida. Yes.

Mr. KEIM. They are marked, too. [Laughter.]

The code requires marking.

Now, you see the pheasant breaks the laminated glass and it tears.

This demonstration does not prove tempered safety glass superior for windshield. It simply illustrates the importance of considering all the tests and the reasons for the tests prescribed in the code.

Likewise, in connection with tests of glass intended for sidelights or rear windows, it is important to consider all of the aspects—what is the most likely hazard to be encountered.

Thus, we can make a demonstration with the 7-ounce steel dart which, in this case, will be our sharp stone. This is a piece of laminated safety glass. In this case the laminated glass simply cracks and breaks and it stops the dart.

If I take a piece of tempered glass, solid safety tempered glass, you see that in this case the dart breaks the glass and goes on through.

However, the fact that tempered glass is approved by the code for all automotive glazing except the windshield recognizes the overall view that there is a reduced likelihood of stones striking the rear

windows or side windows as opposed to windshields—also the difference in the direction of the stone and the difference in velocity, if a stone should strike the side windows.

Some questions have been raised about the sound made when tempered glass is broken. Although I have already broken one piece, I will break another by hammering on the top edge with a screwdriver from which you may draw your own conclusions as to the sound the glass makes when it breaks compared to the sound of the screwdriver breaking the glass.

This is a piece of solid tempered safety glass. I will put it in the frame and break it.

These demonstrations show the differences in the properties and safety characteristics of the two types of safety glass. As I mentioned previously, it is important to consider all aspects when studying matters of this sort. This was uppermost in the deliberations in writing the ASA code. Also it became apparent after thousands of tests that one type of safety glass might be superior to another type safetywise, dependent upon the conditions of an accident. Again quoting from the code:

One safety glazing material may be superior for protection against one type of hazard while another may be superior against another type. Since accident conditions are not standardized, no one type of safety glazing material can be shown to possess the maximum degree of safety under all conditions, against all conceivable hazards.

No completely perfect safety glazing material has yet been invented—we wish there was such a material. Neither type is perfect, but in comparison to ordinary plate or sheet glass they are both far and away safer materials—both laminated and tempered glass are judged by the code as suitable for use in automobile side and rear windows. If ordinary glass is here (at this level) safetywise, tempered and laminated safety glass are here (at this much higher level) safetywise—far superior, and judged suitable by the safety code for glazing side and rear windows in automobiles.

The point to remember is that there is an excellent performance record for these two safety glasses—in side windows and rear windows in millions of motor vehicles now on the highway throughout the world.

Thank you.

Mr. RICHARDS. The engineering decisions to use tempered safety glass in side openings were based in each company on broad field experience supplemented by laboratory testing. Field experience included over 20 years of successful use of tempered safety back lights in over 80 million vehicles and many years of successful use of tempered safety glass sidelights in millions of vehicles operated in Canada and Europe.

Some of the laboratory and proving ground crash tests were filmed and give clear evidence to the layman of certain safety advantages resulting from the use of tempered safety glass in the side openings of motor vehicles.

We could have shown you films, but I gather it is not the desire of the committee to see films.

Those interests opposed to the use of tempered safety glass have claimed that quality control in manufacturing tempered safety glass is difficult if not impossible.

Mr. Ormond I. Rugg, glass engineer, Glass Division, Ford Motor Co., will demonstrate some of the quality control measures used in the manufacture of tempered safety glass.

Mr. Rugg has been with the glass section of the Ford Motor Co. for 37 years. He is a member of the SAE Automotive Glazing Standards Committee and various subcommittees, a member of the American Standards Association Sectional Committee on Glazing Materials Z-26.1 (representing SAE). He is also a member of the American Ceramics Society and the Engineering Society of Detroit.

Mr. Rugg.

Mr. RUGG. Members of the committee, several misleading statements have been made on the subject of manufacturing controls and control testing of automotive glazing materials. A statement has been made, "There is no way to test a piece of tempered glass except to break it." There is some truth in this statement but it is misleading. This is equally applicable to laminated safety glass. There is no way of completely testing either safety glass without breaking it. Therefore continuously, periodic samples of both laminated and tempered safety glass are taken from production and tested to the ASA code impact requirements.

Statements have also been made: "In behalf of laminated glass, all components of the sandwich are regularly checked and tested." This infers that we do not have controls and control tests for tempered safety glass during the manufacturing. This is not true.

Quality is maintained in both laminated and tempered safety glass by process control and each glass manufacturer maintains quality control laboratories well staffed with competent engineers. To give you an idea of how well this control is covered, we, the Ford Glass Division, have 285 men assigned to the manufacturing controls and the quality of automotive safety glass. This is typical of the industry.

Another statement that has been made about tempered glass: "There is no practical way to tell if a finished light of glass has been tempered except by breaking."

All tempered safety glass has balanced stress built into it by the manufacturing process, compressional at the surfaces and tensional at the center and this alone gives it its safety properties, of strength and granular break.

Such stress is visible under polarized light and a pattern can be seen in a polariscope, resulting from the air quench.

I would like to show this instrument (a Polariscope) which can, and is being used to examine finished tempered safety glass parts and eliminate the possibility of the glass not being tempered.

This is a laboratory model of a Polariscope. You have a light source in the back, and then two films of Polaroid, and by crossing the films you cut down the light rays going through there.

Now, one acts like a picket fence where the light goes in just one direction. By crossing it you cut out all the light or practically all of it, and the light only when it is interrupted by strains or stress will show a pattern.

Now, to show you this, this is a piece of tempered glass. You can see the stress pattern in the glass.

This is a piece of regular plate glass or annealed glass which has not been tempered, the same glass except this other one has been tempered, and you can see there is no pattern there at all.

Now, on our production line in the final assembly we have Polariscope that are large enough or big enough to cover the largest piece of tempered glass that we make, and that is our back light, so every piece of glass going down the line is inspected through this type of inspection.

This is a piece of laminated glass which has two pieces of annealed glass with a plastic interlayer, and you can see there is no strain pattern there.

Now, a test that we are familiar with or an implement of testing that we are familiar with, is a hammer, so I would like to break all three of these types of glass with a hammer.

Mr. THOMSON. How do you temper glass? What is the process?

Mr. RUGG. The process of tempering glass is to cut the glass to size, do all the edge work on it that is required.

On flat glass like we use in door lights, and then it is hung by a couple of hooks that are similar to ice tongs where they just go into the surface, and then it is heated up to red heat, about 1,200°, and then it is pulled out of the furnace and then blasts of air from jets are shot upon the surface. As soon as they start striking them they start moving to spread the strain. That is what you see under the polarized light, the stress pattern.

On the back lights or curved glass, it is bent in a horizontal layer, and set in the same way, and the glass by gravity, plus sometimes we have hinges on the end, fixtures or hinges, that assist in bending, and this horizontally goes through a layer where it is heated up to the same heat, about 1,200°, and then it is taken out, and blasts of uniform air are shot upon the surfaces.

This is the ordinary quarter inch plate glass that was used in cars before the use of safety glass.

You see a veritable—it breaks up the edges in sharp and jagged edges, very dangerous in case of an accident.

This is the same glass that has been tempered or strengthened and this is about four to five times the strength of the regular glass.

When it breaks it breaks into granular pieces, and this is not sharp like ordinary glass. It is possible to be cut by little particles that might penetrate the skin.

If I give it impact you can break it through, and these edges, although they are not as sharp as ordinary glass, they are much sharper than the tempered.

Mr. NELSEN. Mr. Chairman, I have a question there.

Why couldn't you use tempered glass and laminated glass? If there is an advantage to laminated glass why don't you use a combination?

Mr. RUGG. That is used in airplane work. But you have to have a certain thickness to temper glass, to give it this granular break.

The thinnest we have been able to make this safety property with strength and granular break is three-sixteenths in thickness.

For a number of years industry used laminated goggle lenses for protection of the eyes in industry, and lot of cases existed where, under certain impact the inner surface of the glass or the inner part of the laminate would spall off and go into the eye, and quite a few eyes were lost.

For the past 15 years, all industry has been using tempered goggle lenses. This is a pair of safety goggle lenses used for either goggles or eye glasses.

You can see the strain pattern here. If it is so dangerous to put in a car why are we using them right next to our eyes?

I personally, with my 37 years of testing, control testing, and specifications on safety glass, drive two cars. One has laminated glass throughout except the back light. The other car has tempered glass throughout except the windshield. I have no fear or anxiety of driving either car because I know they are both very good safety glass.

Thank you.

Mr. RICHARDS. Thank you, Mr. Rugg.

Before going on I would just like to emphasize one point. There has been so much misunderstanding about the way tempered glass breaks. That granular break is what gives it its safety characteristics, and that is what cuts down on the possibility of injury to the passengers. The records of injury, as we will point out, are very low because of that granular break.

Mr. Chairman and members of the committee, in summary, let me point out the American Standards Code for Safety Glazing Materials, now in full force and effect, permits the use of either laminated safety glass or tempered safety glass in the side openings of motor vehicles. If there were any validity to the claim that tempered safety glass is not as safe as laminated safety glass and therefore unsuited for use in the side openings this determination should be made by the experts who are members of this ASA Code Committee. The interests asking you to amend H.R. 903 are represented on this code committee and their contentions are now being thoroughly reviewed by special committees set up to prove or disprove the allegations.

Through the ASA Code there is national uniformity in all 50 States and the District of Columbia with respect to safety glass requirements in motor vehicles. The proponents of this drive to create a monopoly for laminated safety glass have made every effort to disrupt the national uniformity by having bills introduced in the following States:

1. Tennessee.....	1957	7. California.....	1961
2. Pennsylvania.....	1958	8. Kansas.....	1961
3. Massachusetts.....	1959	9. Massachusetts.....	1961
4. Louisiana.....	1960	10. Ohio.....	1961
5. Missouri.....	1961	11. Pennsylvania.....	1961
6. Washington.....	1961	12. Wisconsin.....	1961

And, I should add New York. A bill was introduced in New York, and Senator Spino and his committee came to Detroit and killed the bill after seeing the type of information we have given you today.

Now, public hearings thus far have been held on nine of these bills and after weighing both sides, these State legislatures refused to legislate against the use of tempered safety glass and to abandon national uniformity.

The motor vehicle manufacturers are fully aware of the economic pressures which have prompted this drive against tempered safety glass. Public safety and economic considerations, however, should be paramount to the selfish desires of any special interest group.

The increased use of tempered safety glass by motor vehicle manufacturers is based on satisfactory field experience in the United States, Canada, and Europe over a period of 25 years. This is supplemented

by both laboratory and proving ground research. Cornell Crash Injury Research conducted a study on injuries associated with safety glass in side openings. The preliminary report from Cornell given to SAE June 8-13, 1958, supports the conclusions reached by the motor vehicle manufacturers.

I quote from the concluding statement on page 9 of this report:

Although the data existing at the time the study was undertaken did not permit examination of the full spectrum of the injury problem associated with side window glass, they were sufficient in number and scope to yield the following interpretations:

1. Was there any apparent association between occupant injury and the type of side window glass involved?

When glass damage occurred, observed injuries were associated with laminated rather than tempered glass.

2. Did the association, if demonstrated, serve as any measure of the hazard of each of the two types of glass?

When glass damage occurred, the hazard presented by each glass type affected only a small proportion of car occupants and consisted primarily of lacerative injuries.

I might mention parenthetically that the injuries from the side windows, side openings of motor vehicles are a very small percentage of injuries resulting from accidents.

There is no valid evidence that tempered safety glass is less safe than laminated safety glass for use in side openings of motor vehicles.

Over the years the American Standards Code for Safety Glazing Materials has served the best interests of public safety. This Code Committee has demonstrated that it is fully capable of dealing with current questions and any future developments.

We, therefore, are strongly convinced that there is no valid justification for any legislative action against the use of tempered safety glass.

Now, gentlemen, if there are any questions we have the experts here that, I believe, can answer any questions that you may have.

Mr. ROGERS of Florida (presiding). Thank you.

Mr. NELSEN. For example, in an automobile accident, we will assume that a car upsets. I had an experience once when a young fellow ran off the highway and his car rolled over, and he had to kick the window or windshield out to get out of the car. In a tempered glass that would be possible. With a laminated glass it would be more difficult, would it not?

Mr. RICHARDS. Well, actually, there has been the contention that on egress you can kick out the laminated glasses easier than you can kick out the tempered glasses. Some very definite tests are being run at the present time, and I am of the opinion that you will find quicker egress probably from the tempered because of its shattering, its granular break, which would clear the space very quickly. It does take a little more pressure to break it.

Mr. NELSEN. I have no more questions.

Mr. THOMSON. I would be interested in knowing who is sponsoring this legislation and who is in opposition to the use of tempered glass.

Mr. RICHARDS. Well, the presentation that was made before this group was made by an association of glass installers, replacement glass installers.

They are the retail stores that install glass when it is broken in the motor vehicles, and many dealers have their work done by these glass installers.

Now, they have an association and, as I pointed out, their business in replacing side windows has decreased as the use of tempered glass has increased, and they have attacked tempered glass from a safety standpoint.

But I think the letter that I referred to here makes it very clear what the reasons are. Let me repeat that:

This letter is important to you and your business because if all cars were completely equipped with tempered or casehardened glass—there would be practically no replacement business.

This, we feel, is the economic pressure that has caused all this furor.

Mr. THOMSON. Is there any relation to the price of the two glasses?

Mr. RICHARDS. In which way? I am not sure I understand it.

Mr. THOMSON. Does laminated glass cost more than tempered glass or vice versa?

Mr. RICHARDS. At the present time, due to the manufacturing techniques and increasing production of tempered glass it is lightly below the laminated in original cost, and then there are many savings. For example, in the original installation in motor vehicles the breakage on tempered glass is considerably lower than the breakage on laminated glass from just handling and installation; and then from the standpoint of the owner, when he gets the vehicle, the replacement of the tempered glass is from one-fourth to one-tenth as often.

I might point out that taxicab companies for many years now have insisted on tempered glass in the doors so that when the customers slam the door it will not break. You probably all have had the experience of cracking the laminated glass on your door.

The tempered resists that.

Mr. NELSON. Mr. Chairman, I have another question.

I was interested in a car that is not of common make that you have to cut the tempered glass to fit a door if they do not have an exact pattern. Can tempered glass be cut and shaped to fit any door or do you have to buy it ready made to go into the door?

Mr. RICHARDS. Yes, you have to buy it read made. I am going to ask Mr. Rugg to say something on that. But, first, let me point out that under the code, if a tempered glass breaks in a window, side window, or a car, it can be replaced with laminated glass, which can be cut to shape from a sheet, and this is a practice that is actually being followed.

Now, Mr. Rugg can explain why you cannot cut the tempered glass to shape.

Mr. NELSEN. All right.

Mr. RUGG. I think you understand that it has to cut to size and all because once you temper it, why, you cannot do anything with it. But it can be replaced with laminated glass, the same thickness of glass.

Mr. NELSEN. I have no further questions.

Mr. ROGERS of Florida. I note in referring to the American standard safety code for safety glazing materials that this code was actually developed by the American Standards Association. Is that correct?

Mr. RICHARDS. That is correct. They have a committee.

Mr. ROGERS of Florida. Yes.

Now, it appears that the American Standards Association is a corporation, is that correct?

Mr. RICHARDS. I will let Dr. Ryan comment on the nature of the American Standards Association.

Mr. RYAN. I believe it is a corporation, sir.

Mr. ROGERS of Florida. It appears to be from the statement.

Mr. RYAN. Yes.

Mr. ROGERS of Florida. I just wondered, is it a nonprofit association, organization?

Mr. RYAN. It is a nonprofit organization.

Mr. ROGERS of Florida. Organized under the laws of the State of New York, I presume?

Mr. RYAN. Yes, sir.

Mr. ROGERS of Florida. Could you give us a little information about this organization, who its officers are and, perhaps, how it is carried out?

Mr. RYAN. I do not believe I am too well versed on all the officers of the American Standards Association.

However, it is my understanding that its mode of operation is to create national standards not only for safety glazing materials but for any given material that might be used on a national scale, and a method by which it operates to protect the public interest, the composition of every committee which studies a given subject to develop a code must be such that the public is represented proportionately, and you will note, I believe, by perusing the code itself that corporations, per se, do not have members. It is unusual. I believe there is only one, a member-at-large in the particular case of the safety glazing code, but rather there are societies like the Society of Automotive Engineers, the American Society for Testing Materials, the National Society for the Prevention of Blindness.

There are very many organizations, and some, I think, over 33 total.

In considering the matter of consensus as was done as the result of the 1959 vote, while the vote was 25 to 8 in favor of reaffirmation of the code which, in effect, said, "Let us stay unchanged," there were 8 negative votes, and these 8 negative votes, under the consensus rules, overweighed the 25 positive votes, leading to a reconsideration by the committee of the negative votes.

Now, the people opposing the extended use of tempered safety glass are all represented on the ASA Code Glazing Committee.

They have participated in its meetings, they are active in these task groups to which I referred in conducting tests to prove the relative safety merits of these two glazing materials.

It is very easy to take an accident, any particular accident, and point a finger at one type of glazing material versus another. It gets into the realm of opinions.

What the code committee is presently doing is to try to remove the opinions from this hassle, if you may call it that, and get everybody convinced as to which is the safer glazing material.

Mr. ROGERS of Florida. Yes.

Now, let me ask you this: Are members of the industry on your committees here?

Mr. RYAN. Yes. I happen to represent the American Society for Testing Materials.

The fact that I am, however, employed by Libbey-Owens-Ford Glass Co., in considering negative votes, the fact that you are employed by a participant that, you might say, has an ax to grind commercially, you—

Mr. ROGERS of Florida. Yes.

Mr. RYAN (continuing). That is given due weight, and that is why, of course, the 8 negative votes—1 negative vote, for that matter, might outweigh 50 positive votes, or 50 affirmative votes.

Mr. ROGERS of Florida. Well, who determines how it outweighs?

Mr. RYAN. That is done by the American Standards Association Board, and this board, the composition of which I cannot give you, again—

Mr. ROGERS of Florida. Yes.

Mr. RYAN. But it can be supplied to you.

Mr. ROGERS of Florida. Well, I think it would be helpful to the committee in settling some questions that might be raised if we could put into the record the officers of this association, those interested in the association, the membership, if you have it, the members who compose the various committees, those of the committee who cast negative votes, and those who cast the positive votes and their business interests.

It might be interesting to the committee to have that information not to imply that anything is wrong, but only that it would be helpful to have a knowledge of its operation.

Mr. RICHARDS. We will be glad to furnish that, Mr. Rogers. I call your attention—perhaps you did not read it on the inside cover of the code which we furnished you in the small type at the top—have you read that or shall I read it?

Mr. ROGERS of Florida. I have not read it.

Mr. RICHARDS. Well, let me read it because I think this is quite significant.

Mr. ROGERS of Florida. Fine

Mr. RICHARDS. Would you prefer not?

Mr. ROGERS of Florida. Yes, go right ahead.

Mr. RICHARDS (reading):

An American Standard implies a consensus of those substantially concerned with its scope and provisions. The consensus principle extends to the initiation of work under the procedure of the association, to the method of work to be followed, and to the final approval of the standard.

An American Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American Standard does not in any respect preclude any party who has approved of the standard from manufacturing, selling, or using products, processes, or procedures not conforming to the standard.

An American Standard defines a product, or process, or procedure with reference to one or more of the following: Nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, quality, rating, certification, testing, and the service for which designed.

Producers of goods made in conformity with an American Standard are encouraged to state on their own responsibility, in advertising, promotion material, or on tags or labels, that the goods are produced in conformity with particular American Standards. The inclusion in such advertising and promotion media or on tags or labels or information concerning the characteristics covered by the standard to define its scope is also encouraged.

Well, I might point out that the standards are minimum, and every manufacturer exceeds the minimum, and all of the glazing that is used in motor vehicles is meeting the ASA standard and is advertised as such.

Let me also call your attention further in here that the members of this particular Z-26 code, the organizations represented are listed here, and I refer again to our testimony which pointed out that in its original conception of the safety glazing code, the Bureau of Standards was one of the sponsoring agencies, one of the two; insurance interests were the other.

Mr. ROGERS of Florida. Are there any members who have the primary responsibility of the general public's viewpoint? In other words, are there any members who take a viewpoint other than that of the manufacturers?

Mr. RICHARDS. I might mention the National Safety Council would be such an organization.

Mr. ROGERS of Florida. Yes.

Mr. RICHARDS. The American Association of Motor Vehicle Administrators and, I think, you could place the National Bureau of Standards in that category.

Mr. ROGERS of Florida. Yes. So they are on this particular committee.

Mr. RICHARDS. And the Organization for the Blind. There are numerous groups that are pretty much dedicated to the public interest side—and labor, by the way, is also represented in the code.

Mr. ROGERS of Florida. Thank you.

Now, in the booklet that you have just referred to, which you have just read from, I did notice on the first page there about the middle of the right-hand column it says:

For example, safety glazing materials for windshields must pass a specified group of test requirements, all of which currently can be met only by certain laminated safety glass, although, if and when other safety glazing materials are developed which possess properties such that they, too, fulfill the requirements of the prescribed tests for this location, they may also be used.

But I wondered if you could comment on that, that it could only be met by laminated glass.

Mr. RICHARDS. This is a very involved subject, and let me make some comments and then call on the experts to comment.

Mr. ROGERS of Florida. Yes.

Mr. RICHARDS. I think it is of importance to point out that in Europe tempered safety glass is used in the windshields as opposed to our practice of using tempered safety glass in the ——— or the laminated safety glass in the windshields of the United States.

I just left a meeting of the Bureau Permanente, which is made up of the manufacturers of motor vehicles in Europe, in all the European countries, and they are considering various technical questions where we might be of help to them.

We are a member of their organization, and in talking to some of these technicians they feel very strongly that we have not used the proper reasoning here, that the likelihood of outside objects breaking the windshield and thus giving you an opaque windshield that you cannot see through, they feel that that is much less important than the dangers that arise from the passengers hitting the windshield in

case of a collision, and they point out that in such a case injury is more apt to result from laminated safety glass than the tempered safety glass, and they are, however—

Mr. ROGERS of Florida. You mean hitting the head?

Mr. RICHARDS. Yes.

Mr. ROGERS of Florida. I thought tempered now required more strength to break than the laminated.

Mr. RICHARDS. It does require more strength to break. But there is a peculiarity of medical science that we have papers from Germany and Switzerland that indicate that the possibility of brain concussion is less with tempered glass than with the laminated glass because when the tempered glass does give there is no resistance. It fractures into small particles, and there is no resistance.

In studies made from hospital cases—and I might mention also that the Ford Motor Co. has had the Wayne Medical School, Wayne State University Medical School, conducting tests using actual cadavers.

Mr. ROGERS of Florida. I thought we had in the testimony earlier that that was one of the advantages for putting it in the windshields. It would give sooner, and so it would not cause as much concussion.

Mr. RICHARDS. This was testimony given by the proponents.

Mr. ROGERS of Florida. I see.

Then you disagree with that?

Mr. RICHARDS. Yes. I think the evidence is pretty clear that that is not a valid point.

Mr. ROGERS of Florida. I think it might be helpful to the committee for you to give us the findings of this study. I am sure we had the impression from some of the testimony given that it would be a greater safety feature to have laminated glass. If a person's head hit laminated glass would not shatter and break into small pieces, but would give rather than resist the pressure, a feature which, in my impression, causes greater concussion.

Mr. RICHARDS. That was the impression they intended to give you.

Mr. ROGERS of Florida. Well, if you could give us contrary facts, I think it would be helpful to the committee. I know it would be helpful to me and to the committee to evaluate that point.

Mr. RICHARDS. I might point out that—I will ask Mr. Rugg to develop that.

Mr. ROGERS of Florida. Fine.

Mr. RICHARDS. Because in the laboratory tests that Ford Motor Co. photographed, I thought this point was very well cleared. It was one of the films we wanted to show you, which indicates this particular point, that from that standpoint there is an advantage to the tempered safety glass. Mr. Rugg.

Mr. RUGG. As we pointed out before, there was no perfect safety glass. It is possible to injure through each one, and you have to weigh the percentage of accidents that can happen and the people who are injured, and then measure or weigh the different types of glass and the types of impact that happen to those glasses.

Now, your question in regard to laminated and tempered glass, with regard to fracture and concussion, we have found indications that there is more chance of concussion with laminated glass than there is with tempered glass. We are running more tests on that.

The reason is that to produce concussion you have to have a time in which pressure is held on the head, and for the brain to funnel back to the back part.

Also any doctor will tell you that a fractured skull is a far less injury and less severe injury because the bone will knit together, where a concussion is much more severe. So that you have to weigh that, one against the other, too.

With tempered glass when your head hits it it either bounds back right away so there is no continued pressure there, or either you break through, and there is no force holding it; where laminated glass, with the resistance of your plastic, puts a continued pressure against the skull, and that is what we are finding.

Mr. RYAN. May I speak to this situation? In the deliberations of ASA Code Committee originally one of the primary reasons for not approving tempered glass for use in windshields was the loss of visibility, and there is a distinct loss of visibility in the windshield when tempered glass is broken, and that is especially true at the angles at which windshields are currently being glazed.

The European experience, their cars, their car designs, are different, their car population is different, the type of traffic is different, so I think this is an unsettled question.

There are several facets to this question as to the suitability of laminated glass or tempered glass for windshields.

I think all these factors have to be weighed, and this is the task which has been set forth for the ASA code study committees.

Mr. ROGERS of Florida. Then the primary advantage, I take it from your testimony, is that laminated glass simply is a better means for providing visibility in case of an accident. Is that its primary advantage?

Mr. RICHARDS. That is one of the primary advantages.

Mr. ROGERS of Florida. What would be the others?

Mr. RUGG. Holding the particles of glass to the surface of the plastic under certain impacts, but greater impact, it is possible to go through and penetrate through.

Mr. RYAN. As Mr. Keim demonstrated with that 7-ounce dart, a small, hard object striking tempered glass breaks it. This is the sort of thing that could happen on a highway when a stone is thrown up from truck tires or a bird or so forth. This is really a pretty complicated question.

Mr. RICHARDS. Let me read from the code. I think this is quite pertinent on the degree of safety.

One safety glazing material may be superior for protection against one type of hazard while another may be superior against another type. Since accident conditions are not standardized, no one type of safety glazing material can be shown to possess the maximum degree of safety under all conditions, against all conceivable hazards.

I want to clear up one impression that I may have given. In referring to the Europeans and their attitude, I did not want to infer that we are giving any serious consideration to the use of tempered safety glass for windshields. This is something that would have to be gone into very thoroughly because of these different safety characteristics.

It is not just visibility, but there are other safety characteristics of laminated glass that you would not want to up.

Mr. ROGERS of Florida. May I ask this: Was there a time when laminated glass was used throughout?

Mr. RICHARDS. There was a period. We started in the United States to use laminated safety glass about 1927, and from that period until 1935 the laminated was used exclusively throughout vehicles.

Then, beginning in 1935, the use of tempered safety glass started and, as we pointed out, it was soon used exclusively in the rear windows, and we have had experience with over 80 million motor vehicles in the field.

Its use in the side windows has been mixed in the United States, but in Canada and in Europe it has been in very broad use for the past 25 years.

Mr. ROGERS of Florida. When would you say the automobile industry actually moved into changing from laminated to tempered glass in the side windows?

Mr. RICHARDS. Well, this has been a gradual change with the companies. Some of them just started with this last 1961 model, and they—

Mr. ROGERS of Florida. Could you give us those companies and the dates?

Mr. RICHARDS. Well, different—

Mr. ROGERS of Florida. You can supply it for the record.

Mr. RICHARDS. Yes. Mr. Gandelot, safety engineer for General Motors is here, and maybe he could give you a list of those dates. Can you, Howard?

Mr. GANDELOT. We can supply it, yes.

Mr. ROGERS of Florida. I realize that you would not have it.

Mr. GANDELOT. In Canadian production on General Motors cars I know we have used it for 24 years in side windows.

In the States here it started in about 1955 on the 1956 models used by the Chrysler Corp.

Mr. ROGERS of Florida. I see. And this was approved by the American Standards Association in its code?

Mr. GANDELOT. Yes, sir. Both types of glass have to meet—Mr. Richards, if I may, this was not a point covered by the committee and, perhaps, Dr. Ryan should cover that as a manufacturer because they have to get State approval on glass in accordance with the American Standards safety code Z-26.

Mr. ROGERS of Florida. Yes.

Mr. RYAN. Well, as I believe I pointed out in the discussion which I read, the 1935 code permitted the use of laminated glass in any location in a vehicle. The use of tempered glass was permitted in any location in a vehicle except the windshield.

Mr. ROGERS of Florida. As of what date now?

Mr. RYAN. From 1935 to the present date.

Mr. ROGERS of Florida. Yes.

Mr. RYAN. There has been no change.

Each manufacturer, to comply with the ASA code, must submit samples of tempered glass and laminated glass to the National Bureau of Standards which acts as a testing agency and gives a certificate of approval or compliance, I should say, it is not approval, it is a certificate of compliance with this particular code.

I believe one State, Iowa, insists on conducting their own tests. To the best of my knowledge the remaining 49 States and the District of Columbia all accept the safety glass which complies with the ASA code, and on the basis of the certificate issued by the National Bureau of Standards.

Mr. ROGERS of Florida. Thank you.

Mr. NELSON. I wonder if laminated glass, for example, broke in fragments, if laminated glass would have a greater potential as to hurting the driver than would the broken fragments of a tempered glass? Would it or would it not? For example, if you drive into the windshield the fragments are more dangerous to handle, I noticed, than would be the tempered glass.

Mr. RICHARDS. Generally speaking, where you have blows against the laminated glass that are not sufficient to rupture the plastic there are little or no lacerations. But once you rupture that plastic then you expose these razor-sharp edges that do create lacerative injuries.

Then, of course, you get into more severe accidents if a person should penetrate his head, go clear through, why then you have got a collar of sharp glass, and oftentimes the party coming back pulls this collar up against his neck.

These are gruesome things that happen in accidents that have to be considered.

I might add a point here, that there is so much involvement of a technical nature in a question of this kind that it is pretty difficult to ask any layman group to reach a decision.

The experts that have been working on it and who see through fallacies on various claims are the qualified ones to make these determinations, and that is why this ASA code committee that has been set up, draws from all of these interests and these people serving on that, who are qualified to weigh a claim against another claim and to run the tests.

It takes, for example—you can make a demonstration but we did not feel that we got all of the answers on demonstrations, so we asked the Cornell Crash Injury people to actually study the accidents as they happen, and from that you do not have to have a reasoning deduction that this is dangerous, that this exploding glass, as has been presented to the committee, is dangerous. And people give testimony that if this had been, this exploding glass, we would all probably be blind.

Well, the facts are not that. When you get out and study the cases you find that there is less injury occurring from the tempered glass because of breaking into harmless granulars or relatively harmless, and this is why we have had so much trouble here and having to go around to these States, because the legislative bodies, with only one side of the picture, can become quite excited.

When they got both sides they realized this is a technical question that is being well handled by a technical committee.

Mr. ROGERS of Florida. Let me get Mr. Rugg's answer to that question. I think we strayed from the question. I asked that you comment on this quote from the American Standards pamphlet which you furnished the committee. On the first page, it says:

For example, safety glazing materials for windshields must pass a specified group of test requirements, all of which currently can be met only by certain laminated safety glass.

Mr. RUGG. That is right. They are referring there, if it were possible to make plastic that would comply with the test which they feel is necessary for windshields, then plastic could be approved for windshields, so it is necessary now to have one set of tests for plastic, one for tempered glass, one for wire glass, and one for laminated glass.

Mr. ROGERS of Florida. So that has to do really with only the laminated, because it is the only one that uses the safety glazing.

Mr. RUGG. That is the only one that will stand the tests that are prescribed for windshield location.

Mr. KEIM. May I make a statement?

Mr. ROGERS of Florida. Yes, Mr. Keim.

Mr. KEIM. The code is so written that it does not call for a specific product in an area. It calls for a group of tests.

So in the foreword this is an explanation given which acknowledged the fact at that time and has continued since, that the tests prescribed for windshields can only be met by laminated glass.

In my statement to the committee I made the statement, for example, that the test requirements of the ASA safety codes are such as to require laminated safety glass in windshields.

But if, as Mr. Rugg says, another safety glazing material is developed that will pass those tests other than laminated glass, it can be used, and this is true throughout.

For example, it does not call out the thickness of the glass. That depends on whether it is able to meet the strength and safety characteristics tests.

Mr. ROGERS of Florida. Thank you very much. Is there any further questioning?

(No response.)

I believe those are most all of the questions we have. Thank you very much for this testimony. It has been very helpful to the committee, and we will adjourn our committee hearings now until Monday when we will hear the various Government departments.

(The following additional information was later submitted for the record:)

AUTOMOBILE MANUFACTURERS ASSOCIATION, INC.,
Washington, D.C., May 1, 1961.

HON. KENNETH ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, New House Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: During the testimony of our Mr. Karl Richards and his associates on safety glass at the hearings of April 14, you asked that we submit for the record information relating to (1) the organization of the American Standards Association. (2) the composition and vote of its committee on glazing materials, and (3) European injury experience with tempered safety glass.

The three enclosed documents answer these questions.

In addition, we are sending extra copies to the committee clerk, Mr. Williamson, for distribution to interested members of the committee.

Sincerely yours,

HARLAN V. HADLEY,
Manager, Washington Office.

AMERICAN STANDARDS ASSOCIATION, INC., NEW YORK, N.Y.

In 1918, five leading American engineering societies decided to form a national organization that could coordinate the development of national standards.

The founding societies were: The American Institute of Electrical Engineers; the American Society of Mechanical Engineers; the American Society of Civil

Engineers; the American Society of Mining and Metallurgical Engineers; and the American Society for Testing Materials.

These five societies founded the American Engineering Standards Committee—the forerunner of the American Standards Association. Three departments of the Federal Government, Commerce, War, and Navy, joined the organization as founding members.

In 1928 the American Engineering Standards Committee was reorganized and renamed the American Standards Association (ASA).

In 1948 ASA was incorporated under the laws of the State of New York. A board of directors is responsible for policy, administration, and financial matters. A standards council, representing all member bodies, supervises all technical activities and determines the overall standards policy.

From its modest beginnings in 1918, ASA has grown into a national federation of more than 120 technical societies and trade associations who are either member bodies or associate members. In addition, ASA has some 2,200 company members.

ASA has recognized more than 1,950 national standards as American standards. About 425 standards projects are concurrently active.

Approximately 10,000 engineers, government officials, and representatives of various national groups are participating in these projects.

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J. C. Lawrence, Moylan, Pa., American Institute of Chemical Engineers.

Matthew J. Murphy, chief editor, factory, McGraw-Hill Publishing Co. Inc., New York, N.Y.; member at large.

H. E. Chesebrough, vice president and general manager, Plymouth Division, Chrysler Corp., Detroit, Mich.; Society of Automotive Engineers.

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V. de P. Goubeau, vice president, Radio Corp of America, Camden, N.J.; National Association of Purchasing Agents.

- M. C. Harrison, president, Harrison Construction Co., Pittsburgh, Pa.; member at large.
- A. S. Johnson, vice president and manager, Engineering Department, American Mutual Liability Insurance Co., Wakefield, Mass.; past chairman, Standards Council; ex-officio.
- W. A. Kitts 3d, Schenectady, N.Y.; Atomic Industrial Forum, Inc.
- T. T. Miller, president, Polymer Chemical Division, W. R. Grace & Co., Clifton, N.J.; the Society of the Plastics Industry, Inc.
- M. J. Pitre, vice president, Fidelity & Casualty Co. of New York, New York, N.Y.; Association of Casualty & Surety Companies.
- A. E. Pringle II, vice president, the Pringle Electrical Manufacturing Co., Philadelphia, Pa., member at large.
- D. Roy Shoults, general manager, Aircraft Nuclear Propulsion Department, Atomic Products Division, General Electric Co., Cincinnati, Ohio, Aircraft Industries Association.
- W. J. Sweeney, vice president, Esso Research & Engineering Co., Linden, N.J., American Petroleum Institute.
- T. E. Veltfort, manager, Copper & Brass Research Association, New York, N.Y., chairman, ASA Standards Council, ex-officio.
- Frank H. Roby, executive vice president, Federal Pacific Electric Co., Newark, N.J.; vice president, ASA.
- Richard W. Summey, vice president, in charge of manufacturing, Bridgeport Brass Co., Bridgeport, Conn.; Copper & Brass Research Association.
- John R. Townsend, Special Assistant to Director of Research and Engineering, Department of Defense, Washington, D.C.; president, ASA.

On November 30, 1959, the Association of Casualty & Surety Companies, sponsor for the project on specifications and methods of test for safety glazing materials, Z26, submitted to the ASA the question of approval of the proposed reaffirmation of American Standard Z26.1-1950.

The temporary secretary of the Z26 sectional committee reported the vote of the sectional committee on reaffirmation of Z-26.1-1950 as follows:

For reaffirmation.....	25
Against reaffirmation.....	8
Not voting.....	1
Not returned.....	3
Total voting members.....	37

PERSONNEL OF ASA SECTIONAL COMMITTEE ON SAFETY GLAZING MATERIALS, Z26

Scope: Specifications and methods of testing for safety glazing material (glazing material designed to promote safety and to reduce or minimize the likelihood of personal injury from flying glazing material when the glazing material is broken) as used for all purposes, including windshields and windows of motor vehicles, motorboats and aircraft, and bulletproof windows and partitions.

Sponsor: Association of Casualty & Surety Companies.

Chairman (temporary): Alfred W. Devine, deputy registrar of motor vehicles, 100 Nashua Street, Boston, Mass.

Secretary (temporary): Richard O. Bennett, director, Automotive Division, Accident & Fire Prevention Department, National Association of Automotive Mutual Insurance Companies, 20 North Wacker Drive, Chicago, Ill.

Organization represented	Name and business affiliation	Classification ¹
American Association of Motor Vehicle Administrators.	Alfred W. Devine, Deputy Registrar of Motor Vehicles, 100 Nashua St., Boston, Mass.	D
Alternate.....	Charles W. Reed, Chief, Vehicle Inspection Section, Department of Motor Vehicles, 301 C St. N.W., Washington, D.C.	D
Do.....	Wilbur L. Cross, Jr., director, Division of Engineering, Connecticut Department of Motor Vehicles, 165 Capitol Ave., Hartford, Conn.	
American Automobile Association.....	Capt. R. B. King, safety officer, Department of State Police, Box 1200, Richmond, Va.	C
Alternate.....	Burton W. Marsh, director, Traffic Engineering and Safety Department, American Automobile Association, 1712 G St. N.W., Washington, D.C.	
American Ceramic Society.....	Earl Allgaier, research engineer, Traffic Engineering and Safety Department, American Automobile Association, 1712 G St. N.W., Washington, D.C.	A
American Society of Mechanical Engineers.	Dr. George B. Watkins, chairman, technical policy committee, technical center, Libbey-Owens-Ford Glass Co., 1701 East Broadway, Toledo, Ohio.	E
American Society of Safety Engineers.	Thomas A. Walsh, ¹ American Optical Co., 155 East 44th St., New York, N.Y.	E
American Society for Testing Materials.	Anthony G. Paretto, ¹ assistant safety director, New York Transit Authority, 370 Jay St., Brooklyn, N.Y.	B
Alternate.....	Bruce G. Booth, legal staff, General Motors Corp., 15-242 General Motors Bldg., 3044 West Grand Blvd., Detroit, Mich.	A
American Trucking Associations.....	J. S. Nelson, ¹ research department, Plastics Division, Monsanto Chemical Co., Springfield, Mass.	A
Association of Casualty & Surety Companies.	Dr. J. D. Ryan, director of research, Libbey-Owens-Ford Glass Co., 1701 East Broadway, Toledo, Ohio.	F
Alternate.....	R. E. Hess, technical secretary, American Society for Testing Materials, 1916 Race St., Philadelphia, Pa.	C
Auto Glass Dealers Association.....	Lewis C. Kibbee, chief, Automotive Engineering Section, American Trucking Associations, Inc., 1424 16th St. N.W., Washington, D.C.	B
Alternate.....	T. B. McMath, director, Boiler & Accident Prevention Division, Maryland Casualty Co., 701 West 40th St., Baltimore, Md.	B
Automobile Manufacturers Association.	James L. Keane, engineer, Engineering and Inspection Department, Research Division, Aetna Casualty & Surety Co., 151 Farmington Ave., Hartford, Conn.	B
Alternate.....	Harry Dugowson, ¹ chairman, project 102, Auto Glass Dealers Association, care of National Auto Glass, 1420 Bruckner Blvd., Bronx, N.Y.	B
Cornell University Automotive Crash Injury Research.	Morris S. Gorman, executive secretary, Auto Glass Dealers Association, 76 Court St., Brooklyn, N.Y.	B
Electrical Testing Laboratories.....	M. F. Garwood, chief engineer, materials, Chrysler Corp., Post Office Box 118, Detroit, Mich.	B
Alternate.....	Donald J. Schrum, body developing engineering, Studebaker-Packard Corp., South Bend, Ind.	B
Glass Tempering Association.....	John C. Widman, manager, Advanced Body Engineering Department, Ford Motor Co., Dearborn, Mich.	E
Interstate Commerce Commission.....	William F. Sherman, manager, Engineering and Technical Department, Automobile Manufacturers Association, New Center Bldg., Detroit, Mich.	E
Alternate.....	John O. Moore, director, automotive crash injury research, Cornell University, 316 East 61st St., New York, N.Y.	E
Manufacturing Chemists Association.	E. H. Salter, manager, photometric laboratory, Electrical Testing Laboratories, Inc., 2 East End Ave., New York, N.Y.	A
Alternate.....	A. R. Chick, assistant to the manager, Photometric Laboratory Electrical Testing Laboratories, Inc., 2 East End Ave., New York 21, N.Y.	A
Alternate.....	Robert G. Kohl, Permaglass, Inc., 215 West Main St., Woodville, Ohio.	D
Alternate.....	Harold McMaster, president, Permaglass, Inc., 215 West Main St., Woodville, Ohio.	D
Alternate.....	B. G. Milster, mechanical engineer, Section of Motor Carrier Safety, Bureau of Motor Carriers, Interstate Commerce Commission, Washington, D.C.	A
Alternate.....	Ernest G. Cox, Chief, Section of Motor Carrier Safety, Bureau of Motor Carriers, Interstate Commerce Commission, Washington, D.C.	A
Alternate.....	J. G. Garrels, ¹ Monsanto Chemical Co., Springfield, Mass.	A
Alternate.....	F. E. Wintzer, ¹ Polychemicals Department, E. I. du Pont de Nemours & Co., Wilmington, Del.	A
Alternate.....	F. J. Rarig, secretary, Rohm & Haas Co., 222 West Washington Sq., Philadelphia, Pa.	
Alternate.....	J. F. Woodman, Rohm & Haas Co., 222 West Washington Sq., Philadelphia, Pa.	

¹ See summary.

Organization represented	Name and business affiliation	Classification ¹
National Association of Automotive Mutual Insurance Companies.	Richard O. Bennett, director, Automotive Division, Accident & Fire Prevention Department, National Association of Automotive Insurance Co., 20 North Wacker Dr., Chicago, Ill.	F
National Association of Independent Insurers.	Clyde Cecil, assistant secretary, National Association of Independent Insurers, 30 West Monroe St., Chicago, Ill.	F
National Association of Motor Bus Operators. Alternate.....	W. A. Duvall, general manager of maintenance, Greyhound Corp., 5600 Jarvis Ave., Chicago, Ill. A. W. Koehler, secretary-manager, National Association of Motor Bus Operators, 839 17th St. NW., Washington, D.C.	C
National Auto & Flat Glass Dealers Association. Alternate.....	E. H. Siesel, Locust Auto Glass Co., 3125 Locust St., St. Louis, Mo.	B
National Bureau of Standards..... Alternate.....	Roger Williams, 1053 3d St., Catasauqua, Pa. C. H. Hahner, Chief, Glass Section, National Bureau of Standards, U.S. Department of Commerce, Washington D.C.	D
National Safety Council..... Alternate.....	J. A. Dickinson, Chief, Codes and Specifications Section, Building Technology Division, National Bureau of Standards, U.S. Department of Commerce, Washington, D.C. Dr. G. M. Kline, Chief, Organic and Fibrous Materials Division, National Bureau of Standards, U.S. Department of Commerce, Washington, D.C.	E
National Society for the Prevention of Blindness. Alternate.....	Murray Segal, traffic engineer, Traffic Operations Division, National Safety Council, 425 North Michigan Ave., Chicago, Ill. Daniel G. Reynolds, director, Traffic Operations Division, National Safety Council, 425 North Michigan Ave., Chicago, Ill.	E
Optical Society of America.....	James E. O'Neill, director, industrial service, National Society for the Prevention of Blindness, 1790 Broadway, New York, N.Y.	E
Society of Automotive Engineers..... Alternate.....	Dr. Franklin M. Foote, executive director, National Society for the Prevention of Blindness, 1790 Broadway, New York, N.Y. Dr. Gerald M. Rassweiler, research staff, Physics-Instrumentation Department, General Motors Corp., Box 188, North End Station, Detroit, Mich.	B
Yale Bureau of Highway Traffic.....	Howard K. Gandelot, engineering staff, Vehicle Safety Section, Technical Center, General Motors Corp., Box 56, North End Station, Detroit, Mich.	B
Department of the Army..... Alternate.....	B. Frank Jones, Chetwynd Apartments, Rosemont, Pa. W. C. Lang, Chrysler Corp., Post Office Box 1118, Detroit, Mich.	B
Members at large..... Alternate..... Do.....	George J. Gaudsen, Society of Automotive Engineers, 635 New Center Building, Detroit, Mich. L. H. Nagler, American Motors Corp., 14250 Plymouth Rd., Detroit, Mich. Ormund L. Rugg, Glass Division, Ford Motor Co., 3000 Schaefer Rd., Dearborn, Mich. Roger C. Boyd, technical service engineer, Union Carbide Plastics Co., Division of Union Carbide Corp., River Rd., Bound Brook, N.J.	A
	Thomas Seburn, associate director of research, Bureau of Highway Traffic, Yale University, Stratheona Hall, New Haven, Conn.	E
	Walter G. Queen, Office of Chief of Ordnance, Safety Branch, I.S. & S. Office, U.S. Department of the Army, Washington, D.C.	C
	Carlos J. Hernandez, Office of Chief of Ordnance, Industrial Division, (ORDIP-S), Pentagon Bldg., Room 2E429, U.S. Department of the Army, Washington, D.C.	
	L. A. Keim, Glass Division, Product Development Department, Pittsburgh Plate Glass Co., 1 Gateway Center, Pittsburgh, Pa.	A
	C. A. McCusker, director of sales, Safetee Glass Co., Philadelphia, Pa.	A
	James W. Gibbs, Safetee Glass Co., Philadelphia, Pa. R. G. Whittemore, director, Product Development Department, Pittsburgh Plate Glass Co., 1 Gateway Center, Pittsburgh, Pa.	

¹ See summary.² Indicates members casting negative votes.

SUMMARY

A—Manufacturers.....	9
B—Purchasers.....	10
C—Consumers.....	4
D—Governmental Bodies.....	4
E—Independent Specialists.....	7
F—Insurance Representatives.....	3
Total.....	37

HOW AMERICAN STANDARDS ARE MADE

CONTENTS

3	Introduction
4	History of ASA
5	ASA Objectives
5	Kinds of American Standards
6	Principles
7	Fundamentals
7	ASA Is Impartial
8	Standards Council
9	Getting Started
10	How ASA Operates
17	Glossary and Index

INTRODUCTION

A good bargain is one by which all parties to it profit.

A lasting treaty must be beneficial to all signatories.

A sound national standard must offer advantages to all who are to use it.

A standard is like a bridge connecting two countries. The bridge was built and is used for the normal, honest, self-interest of each country. But both benefit from it.

In the same way, in helping to develop a national standard under ASA procedures, an industry, an organization, a company, or an individual are also serving their own best interest.

In outlining the principles and procedures of ASA, this booklet is intended to show how standards come about — in particular — what facilities ASA offers to those who desire to cooperate in the development of American Standards.

ASA is a service organization whose constitution and by-laws have been written with the main object of meeting all reasonable demands put upon it within the scope and purpose for which ASA was created.

Over the years it has been found that this constitution and its by-laws have provided a useful, practical machinery whereby coordination of the standardization work of the member-bodies and others concerned may be achieved on a national level, thus developing truly effective national standards and solving complex standards problems.

It is a democratic constitution, ensuring equality, justice, and fair representation to all who confer, debate, or act within its framework.

Yet, it is not a rigid constitution that limits the creative activities of those coming to work under ASA auspices. It permits a flexible application and, if necessary, it can be amended.

It will always be adapted to serve the ultimate goal of ASA, which is:

To make life in our machine age simpler, richer, and safer through standardization.

Standardization is dynamic, not static. It means not to stand still but to move forward together.

HISTORY OF ASA

In 1918, five leading American engineering societies decided to form a national organization that could coordinate the development of national standards.

The founding societies were: The American Institute of Electrical Engineers; The American Society of Mechanical Engineers; The American Society of Civil Engineers; The American Society of Mining and Metallurgical Engineers; and The American Society for Testing Materials.

These five societies founded the American Engineering Standards Committee — the forerunner of the American Standards Association. Three departments of the federal government, Commerce, War, and Navy, joined the organization as founding members.

In 1928 the American Engineering Standards Committee was reorganized and renamed the American Standards Association (ASA).

In 1948 ASA was incorporated under the laws of the State of New York. A Board of Directors is responsible for policy, administration and financial matters. A Standards Council, representing all member-bodies, supervises all technical activities and determines the over-all standards policy.

From its modest beginnings in 1918, ASA has grown into a national federation of more than 120 technical societies and trade associations who are either member-bodies or associate members. In addition, ASA has some 2200 company members.

ASA has recognized more than 1950 national standards as American Standards. About 425 standards projects are concurrently active.

Approximately 10,000 engineers, government officials, and representatives of various national groups are participating in these projects.

ASA OBJECTIVES

The ASA does not write standards.

The main functions of ASA are:

1. To provide systematic means for developing American Standards
2. To promote the development and use of national standards in the United States
3. To approve standards as American Standard provided they are accepted by a consensus of all national groups substantially concerned with their scope and provisions
4. To coordinate standardization activities
5. To serve as a clearinghouse for information on American and foreign standards
6. To represent American interests in international standardization work

KINDS OF AMERICAN STANDARDS

The ASA constitution permits practically all types of standards of national importance to be approved as *American Standards*.

The important types of such standards are:

1. Definitions, terminology, symbols, and abbreviations
2. Standards for materials, performance characteristics, procedure, and methods of rating
3. Methods of testing and analysis
4. Standards of size, weight, volume, and rating
5. Standards of practice, safety, health, and building construction

PRINCIPLES

The common standards that developed slowly in the pre-industrial days had a few important features.

They were completely voluntary. (No one was forced to eat with a four-pronged fork.) They came about by common use and general acceptance. When they became impractical, they fell into disuse or underwent a change.

These features are also typical of American Standards.

A standard will be approved as an American Standard only if it is accepted by a consensus of national groups substantially concerned with its scope and provisions.

All American Standards are voluntarily arrived at by common consent and are available for voluntary use. They are subject to regular review, as a result of which they are reaffirmed, revised, or withdrawn.

Approval by ASA lends no mandatory implication to an American Standard. However, American Standards are sometimes adopted by a governmental agency or other organizations for mandatory applications.

FUNDAMENTALS

ASA operates under two fundamental principles.

1. Organizations or groups substantially concerned with the subject matter of a standard, whether a member of ASA or not, have an inherent right to have their views fully considered in the development and approval of an American Standard.
2. An American Standard can be initiated and approved only if a consensus exists of all groups who are substantially concerned with the scope and provisions of the standard.

The consensus principle is crucial in development of American Standards. A consensus does not necessarily mean unanimous acceptance. Votes are weighed rather than counted. A weighty objection of one important organization may outweigh all other affirmative votes. Or a number of negative votes of groups that are only distantly concerned with the subject matter may be discounted in the face of affirmative votes of parties that are vitally affected by the standard.

ASA IS IMPARTIAL

In safeguarding the principles under which American Standards are developed, ASA exercises only judicial functions.

ASA maintains a reputation of being free of any partisan interest, be it of a technical, commercial, or political nature. There is general understanding that ASA operates in the public interest.

An example will illustrate the significance of this impartiality.

Years ago, an association had difficulty in getting its safety standard accepted by a number of states as basis for state safety regulations.

The standard was technically sound and the association was acting with highest motives. But apparently it was considered a special-interest group pursuing its own commercial motives.

The standard was then submitted to ASA and was subsequently approved without change as an American Standard.

As such it was accepted by the States without objection.

STANDARDS COUNCIL

The most important judicial functions exercised by ASA through its Standards Council are:

1. Approval of the initiation of a standards project that has a sufficiently broad national support
2. Approval of the scope of a standard project
3. Approval of the membership of standards committees as to competence and adequate, balanced representation of all groups substantially concerned with the scope of the project
4. Approval as American Standard of standards that meet ASA requirements
5. Required periodic review of all American Standards by those concerned to determine whether the standards should be reaffirmed, revised, or withdrawn

Correlating Boards

In exercising its judicial functions, the ASA Standards Council is assisted by thirteen *Standard Boards*, a *Board of Review*, and a *Committee on Procedure*.

Each *Standards Board* is responsible for a special field. It reviews and considers all matters in connection with standards projects that fall under its jurisdiction and submits its findings and recommendations to the Standards Council. It does not formulate standards nor is it concerned with technical content, except to insure coordination with other American Standards.

The newest phase of the national standardization movement is the Nuclear Standards Board which is responsible for standards projects for industrial and commercial application in the field of nuclear energy.

The fourteen Standards Boards are:

1. Acoustical Standards Board
2. Chemical Industry Advisory Board
3. Construction Standards Board
4. Consumer Goods Standards Board
5. Electrical Standards Board
6. Graphic Standards Board

7. Materials and Testing Standards Board
8. Mechanical Standards Board
9. Mining Standards Board
10. Photographic Standards Board
11. Safety Standards Board
12. Miscellaneous Standards Board
13. Highway Traffic Standards Board
14. Nuclear Standards Board

The Standards Council has vested its authority to approve standards in a *Board of Review*, elected from its own membership.

The *Committee on Procedure* advises the Standards Council on all constitutional and procedural questions arising in connection with national standards activities performed under ASA auspices.

GETTING STARTED

A group of companies, or a trade or professional organization, informs ASA that a national standard is desirable in a certain field.

To obtain the views of all groups concerned, ASA invites all national organizations and groups, including government departments, that are believed to have an interest in the subject to attend a General Conference.

This General Conference makes the following decisions:

1. Should a new standards project be initiated?
If so,
2. What should be the exact scope of the project?
3. What method should be used for developing the standard?
4. Who should take the administrative leadership as sponsor for the project?
5. Who should be represented on the Sectional Committee formulating the standard, if the sectional committee method is chosen?

HOW ASA OPERATES

American Standards come into existence through three basic methods which operate on the underlying principle that there must be a consensus of all parties at interest.

1. Sectional Committee Method
2. Existing Standards Method
3. General Acceptance Method

These methods are also available for revision of standards. However, a competent organization may be assigned Proprietary Sponsorship for revising a standard under its own procedures and submitting the revision to ASA for approval.

Sectional Committee Method

A. *Organization:* The *Sectional Committee* formulates or revises a standard or a group of standards. The membership of all sectional committees must be truly representative of all national groups and organizations substantially concerned with the scope of the standards projects, for example, consumers, producers, and general interests, and should strike a reasonable balance between these groups. Membership in ASA is not essential to participation in the technical operations.

The Sectional Committee may delegate the technical work to subcommittees, especially if several standards are being developed or revised under one project.

The administration of a Sectional Committee is usually in the hands of one or several organizations known as sponsors recommended by the General Conference and approved by ASA through the appropriate Standards Board.

The sponsor has the following responsibility:

1. To organize the sectional committee
2. To ensure that the work is carried out continuously and effectively
3. To provide the necessary administrative services
4. To keep ASA informed on the progress of the work

5. To submit completed standards to the ASA for approval, accompanied by the sponsor's technical evaluation

Further details in regard to this method are available from ASA Headquarters, 10 East 40th Street, New York 16, N. Y., in a document entitled "The organization and work of ASA Sectional Committees" — PR 27.

B. Operation: The main work of the Sectional Committee consists in thoroughly airing the views of all its members and in blending these views into a form that represents a sound solution, satisfactory to all.

When a Sectional Committee has thus formulated a standard, it will in many cases distribute a draft (proposed standard) to all organizations, companies, and individuals that may have an interest in the standard. The draft may also be published in trade journals.

Criticisms and comments that the committee receives are carefully considered, and, if necessary, changes are made in the draft standard.

The Committee then votes by letter ballot on the final draft of the standard.

If the sponsor believes a consensus is obtained, the draft is submitted to ASA for approval as American Standard. In cases of undue delay on the part of the sponsor in submitting a proposed standard to ASA, a member of the Sectional Committee may make the submittal.

The record of the development of the standard, the tabulation of the vote, the reasons for negative votes if any, the relation to standards previously approved, and any other information bearing on the establishment of a consensus are reviewed by the appropriate Standards Board. The Standards Board may either recommend that the Board of Review approve the standard as American Standard, or it may return the standard to the sponsor indicating objections. When these have been overcome, the sponsor then presents the standard once again to the Standards Board for recommendation to the Board of Review for final approval as American Standard.

If the Board is satisfied that a consensus exists and that all other ASA rules and requirements are met, the standard is approved as American Standard and published.

C. Responsibilities of a Sectional Committee Member: A representative of an organization that cooperates on formulating a standard under the auspices of ASA has a number of responsibilities that cannot be shifted to ASA.

1. He is responsible before the general public for the engineering and economic consequence of the standard which he helps to develop.
2. It is his duty to act on the standard committee in accordance with the policies of the organization which he represents, to keep his organization adequately informed, and to consult with his organization when necessary.
3. He is expected to carry out the standards work for which he is responsible with administrative orderliness, competence, and reasonable promptness.

Existing Standards Method

This is the second procedure under which an American Standard can be created.

An existing standard of any organization may be submitted to ASA for approval as American Standard without going through any of the other recognized channels for developing American Standards.

The approval will be given if the following conditions are met:

1. The standard must be truly national in scope and recognition.
2. Proof must be submitted to ASA that those substantially concerned with the scope and provisions of the standard have accepted it.
3. The standard must not conflict with other standards in its field.

The American Society for Testing Materials is foremost among the organizations that have many of their own standards recognized as American Standard.

An American Standard approved under the Existing Standards Method

will not lose its original identity. Such a standard will continue to carry the title and number assigned by the organization that originated it, in addition to its ASA number and its Universal Decimal Classification for international as well as domestic bibliographic purposes.

General Acceptance Method

This is the third ASA procedure for writing an American Standard.

Here is a typical example of how an American Standard comes into existence by General Acceptance.

When both the metric system and the Anglo-American inch system had been standardized, accurate conversion from millimeters to inches and back again was a problem. The legal conversion factor had to be carried to 506 decimal places.

The issue was complicated by the fact that the British inch is three parts in a million shorter than the U. S. inch. American companies with foreign contracts found the situation awkward and costly.

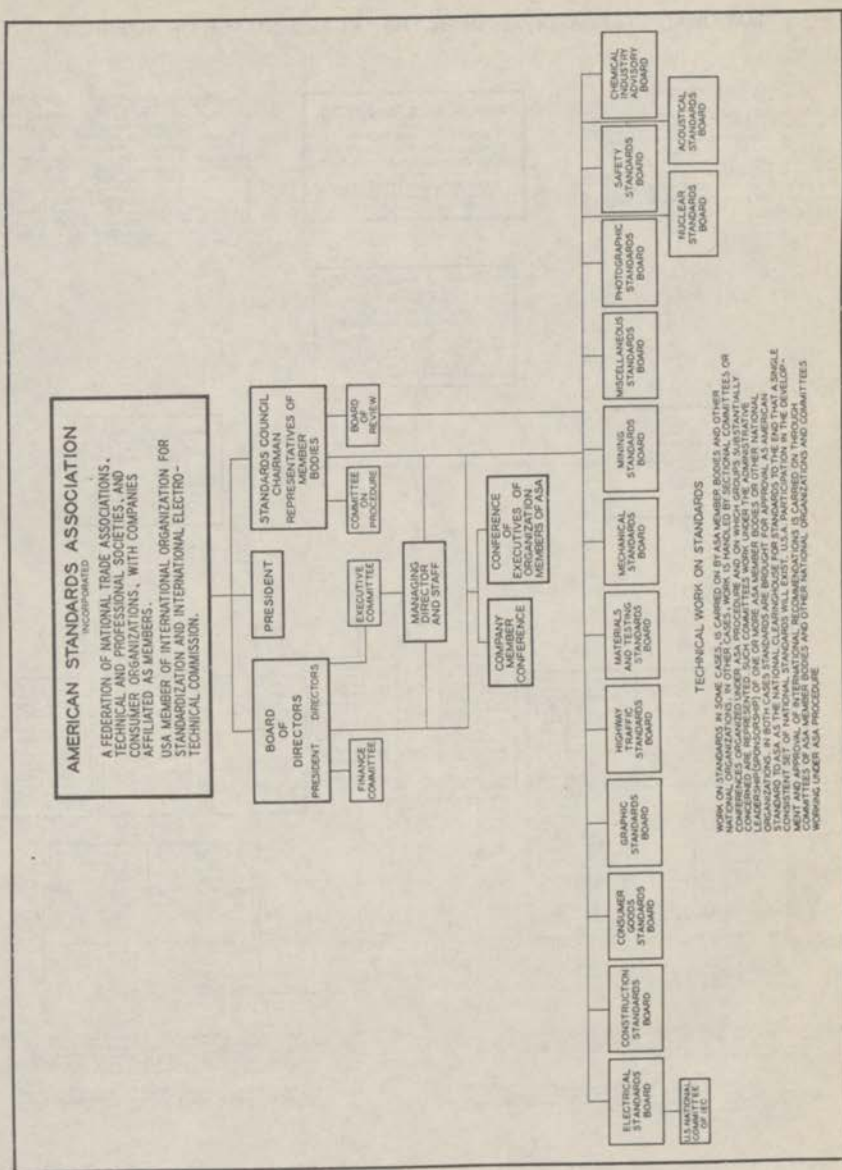
In the 1930's, therefore, a large automotive manufacturer suggested that ASA approve as American Standard a simpler inch-millimeter conversion factor which would be acceptable for all ordinary industrial purposes.

ASA called a general conference to discuss this suggestion. It was attended by more than 50 national organizations.

The conference agreed on the conversion factor: 1 inch = 25.4 millimeters. This was approved as American Standard and is now in use throughout the world.

The method is suitable for comparatively simple projects that do not require prolonged technical discussions.

Under the method, standards are discussed and agreed upon only at a General Conference. No continuing Committees are formed; however, an *ad hoc* committee may be appointed for minor editorial matters. Groups not represented at the conference, but substantially concerned with the scope and provisions of the standard proposed, can give their comments and vote in writing.



NATIONAL STANDARDIZATION IN THE UNITED STATES OF AMERICA

NATIONAL STANDARDIZATION

A PROGRAM FOR THE INTEGRATION OF STANDARDIZATION POLICIES, PRACTICES, PROGRAMS, AND STANDARDS OF GOVERNMENTAL AND NONGOVERNMENTAL AGENCIES TO THE END THAT, A NATIONAL CONSISTENT SET OF STANDARDS DESIGNATED AMERICAN STANDARD CAN BE BUILT AND USED AS A MEANS OF ADVANCING THE NATIONAL ECONOMY, SAFETY, AND WELFARE.

AMERICAN STANDARDS FOR SCIENCE-ENGINEERING PRODUCTION-CONSUMPTION DEFENSE-NATIONAL WELFARE

A NATIONAL CONSISTENT SET OF STANDARDS SUPPORTED BY A CONSENSUS OF ALL AGENCIES

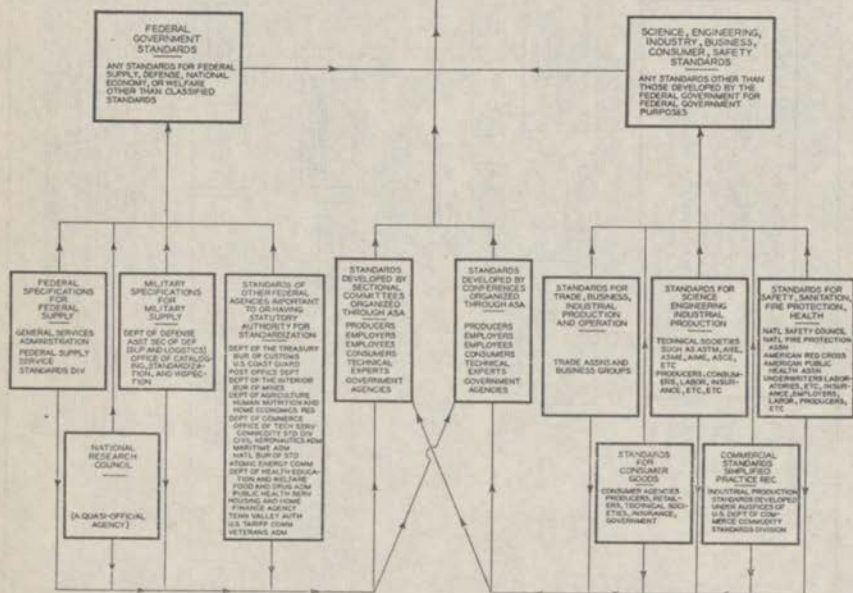
NATIONAL CLEARINGHOUSE FOR STANDARDS

AMERICAN STANDARDS ASSOCIATION, INCORPORATED

PROVIDES MACHINERY FOR ACCEPTANCE AND CORRELATION OF STANDARDS OF ALL AGENCIES, EXISTING OR SPECIALLY CREATED AND FOR APPROVAL OF STANDARDS AS "AMERICAN STANDARD"

AMERICAN STANDARDS ASSOCIATION

A NEUTRAL, NONPROFIT INSTITUTION OF GOVERNMENTAL, INDUSTRIAL, ENGINEERING, CONSUMER, AND PUBLIC AGENCY MEMBERSHIP OPERATING IN THE PUBLIC INTEREST; FINANCED BY INDUSTRIAL, PROFESSIONAL AND PUBLIC ORGANIZATIONS; PROVIDING PROCEDURES TO BE USED FOR THE DEVELOPMENT OF STANDARDS BY VARIOUS AGENCIES AND THEIR APPROVAL AS AMERICAN STANDARD. THE PROCEDURES ARE COMPLETELY DEMOCRATIC IN CHARACTER, GUARANTEE A DAY IN COURT FOR ALL GROUPS, PROTECT MINORITY VIEWPOINTS AND ESTABLISH THE EXISTENCE OF A NATIONAL CONSENSUS OF ACCEPTANCE.



NOTES: ARROWS POINTING UPWARD INDICATE FLOW OF STANDARDS DEVELOPED BY GOVERNMENT OR NONGOVERNMENTAL AGENCIES THROUGH THE NATIONAL CLEARINGHOUSE FOR ACCEPTANCE BY ALL GROUPS CONCERNED AND FOR APPROVAL AS AMERICAN STANDARD.

ARROWS POINTING DOWNWARD INDICATE FLOW OF POLICIES, PRACTICES, DATA, EXPERIENCES OF GOVERNMENTAL AND NONGOVERNMENTAL AGENCIES FOR CORRELATION THROUGH SECTIONAL COMMITTEES OR CONFERENCES ORGANIZED BY ASA FOR THE DEVELOPMENT OF STANDARDS BY ALL GROUPS SUBSTANTIALLY CONCERNED.

AFTER 30 YEARS OF JOINT OPERATION OF ASA WITH INDUSTRY, TEN GOVERNMENT DEPARTMENTS AND AGENCIES WITHDREW FROM MEMBERSHIP IN 1963. AT THE TIME OF THIS REORGANIZATION OF ASA, TECHNICAL COORDINATION CONTINUED AND CHANGE IN ASA MEMBERSHIP STRUCTURE TOOK PLACE AND GOVERNMENT AGENCIES MAY AGAIN HAVE MEMBERSHIP WHEREVER THEIR POLICIES PERMIT.

ASA FINANCED BY INDUSTRY, BUSINESS, PROFESSIONAL AND PUBLIC INTEREST GROUPS BECAUSE NONGOVERNMENTAL GROUPS PROFIT FIRST AND MOST BY STANDARDIZATION WORK.

FEB. 15, 1968

GLOSSARY AND INDEX

The following is a glossary of terms that are likely to be met when discussing or formulating standards under the procedures of the American Standards Association (ASA). A page reference indicates where information about a certain term may also be found in the preceding chapters of this booklet.

American Standard—A standard of national application approved by ASA as having been accepted by all groups and organizations substantially concerned with its scope and provisions.

Associate Member—A trade or professional organization which is a member of ASA, paying dues, but not represented on the Board of Directors or the Standards Council.

Board of Review (p.8,9)—Six members, elected from and by the Standards Council and vested with authority to approve American Standards on behalf of the Council.

Committee on Procedure (p.8,9)—A standing committee which assists the Standards Council in dealing with constitutional and procedural questions.

Company Member—An individual company that supports ASA as a paying member. ASA derives most of its income from company members.

Consensus (p.6,7)—Consensus means substantial agreement of the important national organizations concerned.

Cooperating Body—Any group or organization that is represented on a Sectional Committee or General Conference, or is otherwise cooperating on a standards project.

Correlating Committee—Former designation of what is now a Standards Board.

Existing Standards Method (p. 12)—One of the three procedures by which an American Standard can be approved. This method makes it possible under certain conditions to have existing standards of other organizations approved by ASA.

General Acceptance Method (p. 13)—One of the three procedures by which an American Standard can be created. This method is intended for comparatively simple projects that do not involve lengthy and complicated technical discussions.

General Conference (p. 9, 13)—A meeting called by ASA of all national groups, organizations, and individuals that may be interested in the initiation of a standards project or that may want to consider the adoption of an American Standard by the General Acceptance Method.

IEC (International Electrotechnical Commission)—The international organization for standardization in the electrotechnical field. ASA cooperates with IEC through a special committee of the Electrical Standards Board—the United States National Committee of the IEC.

ISO (International Organization for Standardization)—An organization of the national standardization bodies of 44 countries, including the U. S. ASA represents American interest at ISO meetings.

Member-Bodies — Organizations and groups of national scope who hold the ultimate general authority and responsibility for the policies and affairs of ASA. In fact, ASA is a federation of its Member-Bodies.

Member-at-Large — Individual member of a committee who does not represent an organization or company but is participating in the formulation of a standard on the strength of his specialized knowledge.

Project — Work planned or in process for developing or revising one or more American Standards under ASA auspices.

Proposed Standard (p. 11) — Draft of an American Standard circulated for comments and criticism.

Sectional Committee Method (p. 10-12) — One of the three procedures by which an American Standard can be created. A committee consisting of all groups and organizations substantially concerned with the scope of a standards project formulates a standard. Approval of the standard by ASA requires consensus of the committee.

Sponsor (p. 10) — An organization assigned leadership for a standards project under the Sectional Committee Method.

Standards Board (p. 8) — Supervises on behalf of the Standards Council standardization activities. There are thirteen Standards Boards, each responsible for a special field, and one Standards Board responsible for all fields not covered by any of the other thirteen.

Standards Council (p. 8, 9) — Responsible for all technical activities of ASA. Determines over-all standards policy, including rules for the development of standards and constitution of committees. Approves American Standards. May designate agencies to act on its behalf. Composed of not more than three representatives from each Member-Body who serve term of three years and are eligible for reappointment.



EUROPEAN INJURY EXPERIENCE WITH AUTOMOTIVE SAFETY GLASS

It is estimated that approximately 90 percent of the passenger automobiles manufactured in Europe use tempered safety glass throughout, for windshields as well as side and rear windows. This is not a new practice; it has been followed for at least 25 years.

In Europe the only substantial controversy concerns the use of tempered safety glass in windshields. There the debate centers over whether the obscuration of vision, caused by disintegration of a tempered safety glass windshield when broken by a stone or other sharp object, outweighs as a disadvantage the greater likelihood of injury to a passenger from impact with a laminated safety glass windshield in the event of a major collision.

The above statements are based on an examination of the British and German literature. Several examples are given below:

Extract from "Design and Development of the Hillman Light Car," a paper presented at the SAE passenger car meeting on March 17, 1959, by A. G. Booth and B. B. Winter, Rootes group, England:

"One of the most significant contributions to safety in the current model is the good visibility provided by the extensive area of glass, the thinning of the pillars, sloping away of the engine hood, and the forward position of the driver.

"On the subject of the type of safety glass used in the windshield, there are differing points of view. We meet American legal requirements by fitting laminated glass to all Hillmans exported to the United States but in the home and other markets we fit toughened (tempered safety) glass as the preferred type because we consider it has lower injury potential. We realize there have been objections to toughened glass on account of granulation when struck by heavy, sharp objects with consequent sudden partial obscuration. This state of affairs has been much improved by an alteration of the glass specification, the particle size having been considerably enlarged by a change of count from 40 to one of 20 to the square inch, with a consequent considerable improvement in visibility under conditions of granulation. When shattered, the complete glass can easily be pushed out by hand almost without a scratch to the car occupants. British accident statistics show that whereas the percentage of serious injury arising directly from toughened glass is relatively low, that from laminated glass is much higher, on account of the lethal nature of the large jagged fragments left in the windshield frame which constitute a grave potential danger."

Extract from Road Research Report, 1957, Department of Scientific and Industrial Research, London:

"The most striking features of the results so far obtained in these on-the-spot studies are: the superiority of toughened over laminated safety glass as regards the likelihood of injury to vehicle occupants."

Extract from "Laminated versus Toughened Windscreens—Their Properties Discussed," January 19, 1959, Autocar:

"CONCLUSIONS

"At the beginning of this article it was stated that no definite conclusion could be drawn as to the superiority of one kind of safety glass over the other. Two qualified opinions may be offered, however, in addition to the statement that for all car windows except the windscreen itself, toughened glass seems to be superior.

Omitted paragraph discusses windshields.

"Investigations by the Road Research Laboratory suggest that toughened glass is superior to laminated in respect of injuries caused in major accidents.

Extract translated from "Zentralblatt für Verkehrs—Medizin und Verkehrs—Psychologie und Angrenzende Gebiete" for February 1960 at pp. 30–40:

"The modulus of elasticity of thermally tempered glass is not changed by heat treatment. Upon flexure, ordinary glass breaks easily because the tensile stresses produced on the surface rapidly exceed the low tensile stress limit. The tensile stress occurring in prestressed (tempered) safety glass must first overcome the compressive prestresses existing in the surface layers and only then can it start to become effective itself. Consequently, prestressed plates are surprisingly insensitive to flexure, i.e., they can be bent far more before rupture occurs. However, they have not become harder than ordinary glass. They oppose flexure with the same resistance, only ordinary glass ruptures sooner.

"In ignorance of these facts it was suspected at first that the human head would be endangered when striking tempered safety glass. But so far, the medical profession concerned with traffic accidents knows of no case where a skull was fractured on tempered safety glass. This has been confirmed recently by studies of Walter and Loew, in the *Zentralblatt f. Verkehrs-Medizin u. Verkehrs-Psychologie*, 4/1956, pp. 243-249.

* * * * *

"Supplementary to these considerations a series of experimental studies was conducted some time ago regarding the question of skull injuries on windshields consisting of tempered safety glass. The skeleton of a skull on a sled was allowed to strike windshields of single-plate safety glass at speeds occurring in traffic. All of the glass plates were destroyed by the impact, while the skull suffered no fractures or injuries, although the soft parts covering a living skull, which normally produce a considerable damping of the impact, were entirely absent here."

* * * * *

"In the framework of a research contract from the traffic department of Nordrhein-Westphalia we set ourselves the task of investigating injuries of car passengers and of studying their cause and prevention in 1956, and the first half of 1957. A total of 500 accidents were studied at the site. Photographs were taken in order to determine the contact of the body with the parts of the vehicle. In addition, almost every single patient could be examined in order to be able to record, at least, an exact medical diagnosis in the hospitals. In the 500 accidents which were investigated, 848 car passengers were injured. One peculiarity of the present investigation consists of the nearly exclusive evaluation of accidents within a bounded area (metropolitan Cologne). The injuries were classified into 10 degrees of seriousness. The degrees, 7 to 10, include fatal injuries. One hundred and forty-seven passengers were injured by windshields, which is 17.3 percent of all injured. In this respect, light injuries of the first three or four degrees of seriousness were involved throughout. Passengers on the front seat, i.e., next to the driver, were affected most of all (79 cases—59 percent). The drivers themselves were injured far less frequently, since the steering wheel prevented their heads from going through the windshield."

* * * * *

Due to the fact that laminated glass resists greater forces before dropping out, the number of brain concussions is greater than in the case of tempered glass.

Brain concussions occurred 10 times produced in equal parts by impact on tempered and laminated safety glass, although the ratio of these types of glass was 4 to 1.

Further numerical comparisons between the two types of safety glass:

The exact type of the windshield glass could be determined in 517 vehicles. Four hundred and eight (79 percent) of these cars were equipped with tempered glass, and the remaining 109 (21 percent) with laminated glass. Six hundred and ten injured were in the cars with hardened glass windshields, and 172 were in cars with laminated glass plates.

The proportion of persons injured by the windshields referred to the total number of injured amounted to 18 percent for the cars with tempered safety glass, while it was 22 percent for the cars with laminated glass. In 87 of the passengers injured by the hardened glass, the windshield was destroyed, i.e., 80.5 percent. In the case of laminated glass plates this percentage was higher, i.e., 89 percent. Thus it seems that laminated glass plates are more easily broken by human influences than tempered glass plates: Only 111 of 408 tempered glass plates broke (27 percent) in contrast to 58 of the 109 laminated glass plates (43 percent). Thus, the thesis of a greater torsion resistance of tempered safety glass appears to be correct in this respect.

(Whereupon, at 11:55 a.m., the subcommittee was adjourned, to reconvene Monday, April 17, 1961.)

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MOTOR VEHICLE SAFETY STANDARDS

MONDAY, APRIL 17, 1961

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY,
OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts (chairman of the subcommittee) presiding.

Present: Representatives Roberts, Harris, Rogers of Florida, Schenck, Nelsen, and Thomson of Wisconsin.

Mr. ROBERTS. The subcommittee will please be in order.

The Subcommittee on Health and Safety is meeting this morning to continue its hearings on H.R. 903 and H.R. 1341.

We are honored this morning to have with us a former colleague of ours in the House, the distinguished Secretary of the Department of Health, Education, and Welfare, the Honorable Abraham Ribicoff.

It has been a pleasure for the Chair and Members of the committee to know of his interest in this field, and his great helpfulness in it. I recall that the Chair of this subcommittee visited with him in Detroit a few years ago, and the distinguished Secretary was at that time emphasizing the program in his State which has worked quite well, and has given his State one of the lowest percentages in the number of deaths per hundred thousand vehicles miles traveled. And I think that the wonderful effort that he made there will bear fruit for many, many years to come.

He is one of the men in the field who has demonstrated that highway safety is possible, if people want it and if they are given the guidelines and a course to follow. And that they will do so then quite willingly.

Mr. Secretary, it is a real pleasure to have you here. I appreciate the fact that you are up against a rather tight schedule. You may proceed with your testimony as you desire.

STATEMENT OF HON. ABRAHAM RIBICOFF, SECRETARY OF HEALTH, EDUCATION, AND WELFARE, ACCOMPANIED BY DR. A. L. CHAPMAN, DIRECTOR OF THE DIVISION OF ACCIDENT PREVENTION, PUBLIC HEALTH SERVICE, AND WILBUR J. COHEN, ASSISTANT SECRETARY, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Secretary RIBICOFF. Mr. Chairman and members of the committee, it is a real pleasure to be here, having worked in this field in the State of Connecticut and, also, with the Governors' conference.

I am well aware of what you have done, what your committee has done, and what you are trying to do on a national level.

May I say that I have here a report from my Department concerning H.R. 1341. We wholeheartedly endorse the principle of H.R. 1341.

The Public Health Service in my Department is conducting studies in the field of automobile accident causation and prevention, and we have a vital interest in any method which will help reduce the number of automobile accidents and resultant injuries and deaths.

Experts generally agree that the human factor, rather than mechanical inadequacy of motor vehicles, is the cause of most accidents. Nevertheless, improvements in design and equipment of cars can, to some extent, compensate for this factor, not only from the point of view of accident prevention but, even more, from the standpoint of reducing the severity of injuries when accidents do occur.

I shall read a few pertinent paragraphs from this report before I go on with the formal testimony.

Considerable knowledge already exists which, if utilized by motor vehicle manufacturers, would tend to reduce at least the severity of injuries suffered in such accidents. For example, we believe that seat belts, or at least anchorage for seat belts, should be standard equipment for passenger cars and buses; that seats should be so anchored as to lock them into position; that there should be crash padding of the dashboard, roof, and other areas of the vehicle against which passengers might be thrown; that there should be improvements in the steering wheel, in addition to recessing of the post; and that the interior of the car should, so far as it is possible, be cleared of dangerous knobs, sharp edges, and so forth.

The Government should at the same time urge manufacturers to include such devices and fixtures in cars in standard equipment so far as feasible.

I would like to submit this report to you for your record, Mr. Chairman.

Mr. ROBERTS. Without objection, the report will be made a part of the record.

Secretary RIBICOFF. Thank you for inviting me to present the views of the Department of Health, Education, and Welfare on the subject of the Federal responsibility and capability to assist in reducing the tragic annual toll of highway accidents. On this subject, I am sure we shall find a high degree of unanimity of opinion between this committee and my Department.

The almost 40,000 needless deaths in highway accidents cause the loss each year of almost 1½ million man-years of productive activity. These losses drastically reduce the productive capacity of this Nation. While these deaths exact high costs, in both human and economic terms, they fade almost into insignificance when we consider the traffic injuries to over 4 million persons every year. A large percentage of these victims are in, or are approaching, the potentially most useful years of their lives. The sudden removal of this great number of people is a recurring and continuing disaster.

The accident prevention activities of the Department have largely been centered in the Public Health Service. However, other major

bureaus of the Department have a very real interest in reducing the number of deaths and injuries from accidents.

For example, the interest of the Children's Bureau in accidental deaths and injuries is assured, since accidents are the most important cause of death and disability in children. Much of the excellent services rendered by the fine staff of the Children's Bureau in saving the lives and improving the health of children are erased by motor vehicle accidents.

The Office of Vocational Rehabilitation has a significant stake in accident prevention. Many of their activities are devoted to attempts to partially compensate for permanent disabilities induced by traffic accidents.

The financial burdens of the Social Security Administration are magnified by the mounting welfare costs directly associated with unemployment because of auto accidents.

Fortunately, the nucleus of an accident prevention program (four people in all) was established in the Public Health Service in the early 1950's.

For a number of years the rate of growth was small. In 1956 the budget for this activity was in the neighborhood of \$50,000.

The first basic research grant for accident prevention was made in 1951.

In 1957 the Public Health Service, together with the American Public Health Association and other professional groups, began to see more clearly the responsibility of the Public Health Service, State and local health agencies, physicians, and their professional allies in traffic accident prevention.

Recognition of this responsibility, once achieved, has resulted in strong support from Congress and the professional groups involved. For example, in fiscal year 1961, Congress added a million dollars to the appropriation for the activities of the Division of Accident Prevention.

At the same time a decision was made to transfer the administrative aspects of basic research grant management in the field of accident prevention to the Bureau of State Services. This responsibility has been delegated to the Division of Accident Prevention.

Expansion of accident prevention activities both in research and application has quickly followed.

The total staff of the Division of Accident Prevention now numbers 122. Of this total, 34 are engaged primarily in traffic accident prevention activities.

The number of basic research grants in accident prevention rose to a total of 33 in 1961, of which 23 were concerned with research in various aspects of traffic accident prevention.

A few examples of current traffic accident prevention activities alone, conducted by the Public Health Service during 1961, will suffice to illustrate the broad scope and extreme complexity of this acute health and safety problem:

I. APPLICATION

1. A National Conference on Driving Simulation was held in California in February 1961. Jointly sponsored by the Public Health Service, the Automotive Safety Foundation, and the Department of

Commerce, it served to develop a consensus concerning the need for simulation devices.

2. In Pittsburgh, Pa., in May 1961 a similar workshop entitled "Alcohol and Driving" will be held to bring together all available knowledge concerning the relationship of alcohol and traffic accidents. Cosponsored by the National Institute of Mental Health and the Division of Accident Prevention, five regional conferences of experts were held to prepare material for the mill.

3. The national seat belt campaign, jointly sponsored by the Public Health Service, American Medical Association, and National Safety Council, achieved its initial success when the five leading American manufacturers of automobiles agreed to install attachment points for front seat belts in 1962 models.

4. The Connecticut accident prevention study is making a notable contribution to the development of better scientific research methods in identifying the basic, underlying causes of traffic accidents.

It would be too time consuming to go into detail concerning many other traffic accident activities that have resulted from congressional action. A partial listing follows:

1. Driving simulation feasibility studies.
2. Films on seat belts.
3. Participation in the action programs of the President's Committee for Traffic Safety and the National Safety Council.
4. The development of cooperative activities between the State motor vehicle administrators, State health officers, and State medical societies through national and regional conferences.
5. A saturation publicity program in Cleveland, Ohio, in cooperation with the Greater Cleveland Safety Council.

II. RESEARCH

1. Automotive crash injury research (\$118,242).
2. Experimental case studies of traffic accidents (\$86,081).
3. Causes of auto accidents of adolescent drivers (\$30,782).
4. Evaluating highway traffic safety motion pictures (\$14,894).
5. Accident inducing characteristics of motor vehicles (\$84,953).
6. Research on fatal highway collisions (\$159,332).
7. Safety devices for automotive vehicles (\$15,111).
8. Driving behavior and traffic accidents (\$19,610).
9. Human factors in traffic safety (\$9,210).

In addition, there were several other research projects directly related to traffic accident prevention research, as well as several others of broader interest.

The greatest problem currently besetting the Department of Health, Education, and Welfare, the Public Health Service, and the Division of Accident Prevention is making a determination of how best to allocate the personnel, funds, and other resources currently available in the face of what at times appear to be overwhelming demands.

The greatest asset to the Department of Health, Education, and Welfare in assuming its rapidly expanding role in traffic accident prevention has been the friendly, helpful, and always cooperative attitude exhibited by other Government agencies, with a longer history in traffic accident prevention; the National Safety Council; and other equally well-known voluntary and professional organizations.

Truly, the traffic accident prevention effort has been and, I am confident, will continue to be a genuinely cooperative and mutually stimulating operation.

WHAT CAN THE DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE DO
IN ACCIDENT PREVENTION?

Accidents and accidental injuries and deaths have been an integral part of living since the days of primitive man.

As long as man is fallible and human environments continue to provide accident hazards (as they always will), accidents undoubtedly will continue to plague us.

However, a nation which has succeeded in reducing so dramatically the threat of once widespread infectious diseases cannot in good faith reject the challenge to mobilize these same scientific resources to lower the currently large and for the most part unnecessary toll of accidental deaths and injuries.

Past efforts to render human environments less hazardous have not been without success. Such efforts have been particularly fruitful in the case of large industries. Efforts will continue unabated to improve the safety of the environment.

However, in the past much less attention has been paid to the importance of human factors in accident causation—to the importance of physical (e.g., vision and hearing); psychological (e.g., moods); and physiological (e.g., drugs and alcohol) factors which so strongly affect people who drive automobiles. This is a phase of accident prevention the study of which is peculiarly fitted to the talents of physicians, public health workers, and their professional allies.

A much better understanding of these factors, based on sound research, is essential if the control of accidents is ever to be placed on an effective and truly scientific basis. For example, it is obvious that some people can work, live, and play safely in environments containing relatively few accident hazards.

Accident prevention, a complex problem, cannot be solved by the use of signs, placards, and postcards. This has been proven.

The Department of Health, Education, and Welfare is taking the first steps along this research trail the end of which will be the production of lifesaving knowledge which can be applied in every city, town, and hamlet in this country.

RESEARCH

The Cornell crash injury research project, in which the Public Health Service cooperated, serves as an excellent example of how research can translate basic facts into an applicable system of knowledge.

Last month the application phase of this research project culminated in an agreement by the five leading American manufacturers of automobiles to install attachments for seat belts in the front seats of all cars sold in 1962.

Such researches are costly. They are time consuming. They require the recruitment of significant numbers of talented researchers who are dedicated to the accomplishment of a single purpose.

Similar applicable knowledge can be obtained through research involving a multiplicity of factors, both environmental and human, which are the basic causes of many of the 90,000-odd deaths from accidents each year.

The research grant program of the Public Health Service is expanding. As it expands, it will encompass an ever-broadening range of traffic accident research problems with equally applicable results.

Just a few selected examples of needed research will help to pin down this point:

(a) What are the minimum skills and abilities that are needed to safely operate a modern passenger car? No one knows. No one has attempted to find out in a systematic way.

(b) What effect do drugs, fatigue, and alcohol have on driving efficiency? There have been a lot of intelligent guesses but few, if any, truly objective determinations.

(c) Which, of the 250 identifiable psychological factors, contribute significantly to automobile accidents? No one knows. Several researchers have made a small beginning in researching small facets of this problem.

(d) Are elderly people being arbitrarily deprived of their driving privileges because of opinion rather than fact? No one can say definitely until basic research in this area is done.

The Public Health Service intends to pursue such research leads as these as rapidly as possible in order to build a foundation of fact for law enforcement.

Today the Public Health Service has no facilities for conducting intramural research in accident causation similar to the intramural research facilities that are available to other national research centers such as the National Institutes of Health. As soon as possible such facilities will be provided, not only because of their stimulating effect on research efforts outside the Government, but also because of their training value for young men and women interested in a career in accident prevention research.

Oftentimes, before basic research findings can be applied for the purpose of saving human lives, an intermediate step is needed—namely, applied research. The breadth of the accident research problem, its depth and scope, suggest the necessity of greatly increasing the number and types of applied research projects which are so essential to the application of newly won basic knowledge.

There is the problem of attracting, and maturing, a growing number of highly qualified research workers in the field of accident prevention. A technique found very useful and productive by other institutes has been their program of

RESEARCH FELLOWSHIPS

It is planned that accident prevention research fellowships will be provided to insure steady flow of qualified researchers into the ranks of those who dedicate their lives to finding the true causes of highway accidents.

Mr. ROBERTS. I do not want to interrupt your testimony, but we have a fine group of high school students here from Florida. They, probably, do not know you. This is our Secretary of Health, Education, and Welfare, the Honorable Abraham Ribicoff.

I assume that they know this gentleman over here from Florida—the Representative from Florida, and this is Mr. Schenck, the gentleman from Ohio; Mr. Nelsen, the gentleman from Minnesota, and Mr. Thomson, the gentleman from Wisconsin.

This is the Subcommittee on Health and Safety of the House Interstate and Foreign Commerce Committee. We are very grateful to you for appearing at this hearing. I am sorry that we do not have enough seats for you, but I know that you will enjoy your visit to the Capitol. It is a pleasure to have you with us.

Secretary RIBICOFF. Since this is a part of safety, and I have spent 6 years working with youngsters of this age, may I comment to them for a few seconds? I think it might be helpful to the committee as well.

I will ask what age groups you young ladies and men represent?

Mrs. DORIS LEWIS. This is the membership of new Mu Alpha Theta, which is a mathematical organization, a national organization. And these people represents our 11th and 12th grade students in the mathematics department who have attained distinction in mathematics.

Secretary RIBICOFF. How many of you drive automobiles; raise your hands?

Practically all of you.

Mr. Chairman, I would just like to point out that the greatest incidence of accidents takes place in the group that is covered by this age category that we have here. It is a great tragedy that young people such as these, who are about to enter their full careers in life and are the apples of their respective parents' eyes, because of recklessness and indifference, cause not only death and suffering to themselves, but cause so much harm and pain to their friends and families. And it cannot be too much emphasized or emphasized too strongly that the need we have in America is to have in the minds of the young boys and girls, such as these, the need for courtesy, for obedience of the laws, for understanding and common decency in the driving of an automobile.

Basically, older people get bad driving habits and there is not much we can do about that, but if youngsters, such as these, get good driving habits at this age, they will last a lifetime. Education is one of the most important factors, along with enforcement and engineering, to solve this crime.

I have said many, many times in talking to high school groups such as this—and I have been around in my State talking to these groups—that one of the ways to cut this down is for you young girls to stop dating the "wise guys" in your classrooms, because the average boy 16 or 18 years of age thinks he is a pretty big pumpkin, Mr. Chairman. And he likes to get in an automobile, and he likes to show off, and he gets into tragedies. He tries to beat that red light, and he tries to beat someone in getting away in traffic. They do not pay much attention. Of course, this one-armed driving does not do any good in highway safety either. [Laughter.]

I have always said that if, instead of the "wise guy" being the popular fellow in the class, if the girls would stop dating the boy who does not drive carefully, who speeds and is reckless, you would find the young men would start driving their cars in a good manner.

So you, young ladies, have a big role to play, and I do hope that you will heed this, the great loss to this country, and the fact that among this group there is represented the greatest incidence of highway accidents and deaths in America.

Mr. ROBERTS. Thank you.

Mr. ROGERS of Florida. Thank you, Mr. Chairman, and thank you Mr. Secretary, for your remarks to this group from Vero Beach. I know they have appreciated your remarks. I think you realize that it is an honor to have the Secretary of Health, Education, and Welfare interrupt his testimony to the committee to talk to you. He has had a most distinguished career as the Governor of his own State and is now serving as Secretary in the Cabinet.

We are proud of these students. They will heed your advice, because they are all A students. I know they will take the responsibility of your remarks.

Thank you for your courtesy.

Secretary RIBICOFF. I thank you. I have seen bright youngsters like these. I know what you are doing, Mr. Chairman and this committee, is just aimed at saving the lives of children such as these and I wanted to address a few remarks to them.

Mr. ROBERTS. We certainly appreciate that. You may proceed.

SIMULATION

Secretary RIBICOFF. No discussion of research, no matter how brief, could be considered complete without at least passing mention of the need for the development of simulation devices as tools for research workers who wish to study the effect that human factors have on accident causation.

It is dangerous to experiment with drivers of automobiles in actual driving situations. Such a process is also extremely costly since a traffic accident occurs only about every 60,000 miles of travel. Therefore it is essential to support the developmental research required to permit the construction of several prototype simulators so that drivers can be studied under controlled conditions, in safe environments, thus avoiding the expensive nationwide epidemiological network that might otherwise be necessary (if it were feasible).

In addition to supporting the construction of several prototypes of true simulators in which the driver has the illusion of almost complete reality, there also is a necessity to support the development research involved in producing part-task simulators which can produce valuable and needed information in such limited areas of driver interest as vision, hearing, reflexes, etc. However, the validity of the research findings of part-task simulators can only be validated by checking out samples of their research findings on a true simulator.

At the recent workshop held in Santa Monica, Calif., on the subject of simulation (this conference was jointly sponsored by the Automotive Safety Foundation, Public Health Service, and the Bureau of Public Roads), there was a remarkable unanimity of opinion concerning the need for producing a faithful simulation of the driving situation, just as the Armed Forces have found it necessary to produce a faithful simulation of flight experience using various models of planes, and the Navy with various types of submarines.

Since this group of experts in simulation and research have arrived at this conclusion, efforts will be extended to provide to researchers in the field of accident prevention the one tool that apparently is essential to unlocking so many of the hitherto inaccessible mysteries associated with traffic accident causation.

In brief, the Department will move rapidly to close the gap in applied technology between current research instrumentation and instrumentation that will take advantage of present technological knowledge recently developed.

In no other way can progress toward the goal of identifying and properly evaluating the human factors involved in traffic accident causation be made so rapidly and effectively.

APPLICATION

Some facts are so obvious, they long escape detection. This is particularly true of the fact that no matter how enlightening a research project may turn out to be, it remains of only academic interest until, through applied science, it is translated into a lifesaving potential.

Throughout the United States there are scattered concentrations of interest, skill, and ability that can be readily mobilized to fight the war on accidents if only a small contribution can be made available, in the form of project grants, to assist in the inauguration of unused plans and programs. Pump priming is badly needed. It is planned to seek methods whereby these interests and skills can be mobilized, particularly at the local level, in the next few years.

With a little help or boost, there are hospitals which can improve the training of their emergency squads; there are poison control centers which can conduct poison prevention programs; there is a tremendous latent interest in traffic accident prevention projects in many universities and schools throughout the Nation which can be activated if booster shots are made available. A number of motor vehicle administrators, medical societies, and health departments are concerned and alarmed about the primitive status of driver licensing in their States and communities. They want to change this condition. With a little outside help they can bring about the changes that are needed. The Department plans to assist them in getting their long-delayed plans underway.

The capabilities of the Department of Health, Education, and Welfare, particularly the Public Health Service, to give professional advice to the many persons and agencies who daily seek answers to tough problems involving State or local traffic accident prevention will be increased rapidly. Each of these inquiries represents the nucleus of a community activity which, if properly nourished, can grow into a lifesaving action program. Experts in traffic safety, many of whom are currently available to the Public Health Service as consultants, will be called on with much greater frequency to extend the capabilities of the Service in the general area of technical assistance and consultation, particularly on matters pertaining to cutting down the toll of highway deaths.

Finally, following the historical success of the Department of Agriculture, young men and women will be trained in the specialty of accident prevention; they will be assigned to State and local areas; there they will encourage and consult with local officials who wish to improve their State or local traffic accident prevention services.

These young men and women will need to be trained, but once trained they will vastly expand the ability of the Department of Health, Education, and Welfare to assist in the growth and development of local projects in accordance with the capabilities, interests, and circumstances inherent in local situations.

INFORMATION EXCHANGE

The growing number of projects in all phases of traffic safety in the United States and the mounting interest in the citizenry in this subject have created a deluge of incoming information concerning State and local activities. If this information is not scientifically collected, tabulated, analyzed, and made readily available for rapid dissemination to other interested groups, one of the most valuable weapons of the Department's traffic accident prevention program will have been neutralized.

Why should community B struggle through the developmental phases of a program or project which, if the experience of community A in conducting a similar project were readily available, could be avoided?

If a unique and successful method for motivating citizens to wear seat belts is developed in one community, is it not wasteful and foolhardy for other communities to repeat the same project in order to arrive at the same results?

A wealth of invaluable data already has been collected in the field of traffic accident prevention, both in the areas of research and application, by the Public Health Service. It is planned, therefore, to continue the development of better and more scientifically sound, effective, and economical methods of soliciting such valuable information, digesting it, and making it readily available to others who show an interest in kindred projects and activities.

A modern information exchange program can serve as the focal point of information gleaned from the experiences of State and local agencies and others.

This center will have the responsibility for producing audiovisual messages in modern garb that can convey even to the mildly interested knowledge that has been collected for educational purposes.

TRAINING

It is the plan of the Department of Health, Education, and Welfare to develop three types of training activities to produce an adequate number of physicians, public health workers, and members of allied professions to carry the growing burdens imposed by the complexities of modern traffic.

1. Short courses and seminars will be held for the purpose of teaching newcomers the concepts, principles, and practices which are peculiar to this new branch of public health. These seminars are in great demand throughout the States and in many localities.

2. Medium-range courses of 4 to 8 months' duration will be held to train young men and women, and public health professionals as well, in accident prevention techniques. Such training courses (curriculums have already been contracted for) will provide the maturity in acci-

dent prevention required of staff members assigned to States and localities. These courses, however, will also be available for the training of State and local sponsored trainees.

3. Long-range training will be provided in increasing amounts in a growing number of schools of public health, medical schools, and other professional schools for the purpose of encouraging physicians, public health workers, engineers, nurses, and others to integrate accident prevention activities into their daily tasks wherever they may be located or employed.

Finally, it is planned to provide training grants to institutions to make it possible for more accident prevention materials and projects to be included in everyday teaching curriculums.

Gentlemen, the Public Health Service is going to do its best to save the lives of the people of our Nation.

Mr. ROBERTS. Thank you, Mr. Secretary. The subcommittee, certainly, appreciates your statement on the information contained in there as it reflects the efforts made by the Department of Health, Education, and Welfare in a very important field.

I appreciate the fact you pointed out as to the increase in basic research, in your plans to support these various projects which we believe will give us some answers in this field where there is not too much real activity so that we may save more lives and prevent injuries.

I would like again to thank you very much for the endorsement of H.R. 1341. While the chairman of this subcommittee does not believe that this particular bill is the total answer, we do believe that it will establish the leadership of the Federal Government in this particular field and the public will be guided somewhat by the fact that these safety devices after having been recommended by a proper department of Government are included on cars as standard equipment.

We think, too, that this bill will give us a body of statistics as to the value of these particular devices which we have not had in the past.

I notice that what you had to say about the problem in reference to a simulator. I would like to know if you can tell us what is being done in that field at the present time.

Secretary RIBICOFF. Mr. Chairman, for the purpose of the record, since you mention the grants, I would like to have inserted in it the full list of grants and the amounts, which I think would be very interesting to the committee.

Mr. ROBERTS. Without objection that may be done. That will give the names of the institutions?

Secretary RIBICOFF. And the people and the type of research grants that are being carried on across the Nation at the present time.

I think it would be informative and, also, instructive and interesting.

(The tabulation follows:)

Accident prevention research grants

Grant No.	Principal investigator and institution	Title of project	Fiscal year 1960	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964
RG-4957 (C4)	Mr. Merwyn A. Kraft, Cornell University	Automotive crash injury research.	\$118,242	\$118,242	\$118,242		
RG-4958 (C2)	Dr. D. M. Bissell, San Jose Health Department	Accidental poisoning as a casefinding procedure.	13,000	21,877	17,682		
RG-4959 (C2)	Mr. James S. Baker, Northwestern University	Experimental case studies of traffic accidents.	86,081				
RG-4977 (C2)	Dr. J. Roswell Gallagher, Harvard College	Causes of auto accidents of adolescent drivers.	30,780				
RG-4986 (C1)	Dr. Irving Merrill, Michigan State University	Evaluating highway traffic safety motion pictures.	14,894				
RG-4987 (C1)	Dr. James R. McCarroll, Cornell University Medical College	Field experimental studies on accidental trauma.	53,448	53,448			
RG-4973	Dr. Jack W. Dunlap, Public Service Research Institute, Inc.	Accident-inducing characteristics of motor vehicles.		84,953			
RG-4984 (C1)	Dr. Alfred L. Moseley, president and fellows of Harvard College	Research on fatal highway collisions.	139,543	159,332	183,753	\$211,312	
RG-4990 (C1)	Dr. Leslie Corsi, Jr., State of California Department of Public Health	Epidemiology of childhood accidents.	56,530	53,270			
RG-4991 (C1)	Dr. Abram M. Barch, Michigan State University	Skill decrement in continuous driving.	12,247	10,350	11,730		
RG-4994	Dr. George G. Salvendy, Snell Memorial Foundation, Inc.	Impact attenuation in protection against concussion.	10,300	6,500			
RG-6284 (C1)	Dr. James J. Ryan, University of Minnesota	Safety devices for automotive vehicles.	46,431				
RG-6286	Dr. Harold L. Henderson, Drivers Safety Service, Inc.	Mass communication and group discussion techniques.	15,111	1,236	661	373	\$373
RG-6359 (C1)	Dr. Bruce D. Greenfields, the regents of the University of Michigan	Driving behavior and traffic accidents.	19,610	19,610			
RG-6384 (C1)	Dr. Herbert R. Lissner, Wayne State University	Effects of acceleration on the human skeleton.	20,176				
RG-6506 (C1)	Mr. Merwyn A. Kraft, Flight Safety Foundation, Inc.	Aviation crash injury research.	48,723				
RG-6550	Dr. Robert A. Spicar, Department of Health, Honolulu, Hawaii	Human factors in traffic accidents.	9,210	43,985	25,000		
RG-6658	Mr. Merwyn A. Kraft, Flight Safety Foundation, Inc.	Research in general aviation safety.	77,622				
RG-6717	Dr. Edward R. Schlesinger, Health Research, Inc., Albany, N.Y.	Rockland County child injury prevention project.	36,425	36,754	37,490	10,868	
RG-6763 (A)	Dr. John L. Whitelaw, Michigan State University	Bibliography of highway traffic safety literature.	2,300				
RG-6798 (A)	Dr. Leon Brody, New York University	Needed research on child accident prevention.	2,300				
RG-6819	Mr. J. H. Mathewson, University of California at Los Angeles	Transportation human factors: Pt. I physical forces.	44,706	52,756	17,825		
RG-7011	Dr. Stanley A. Abercrombie, National Education Association	School-age accidents and education.	65,678	55,486			
RG-7025	Dr. Herbert H. Jacobs, Public Service Research Institute, Inc.	Driver education and accident-avoiding behavior.	98,644	46,142			
RG-7044	Dr. Robert P. Shumate, International Association of Chiefs of Police (District of Columbia).	The effect of enforcement on driving behavior.	73,867	87,907	47,741		

R-G-7050.....	Mr. John H. Mathewson, University of California.	Automobile collision injury experiments, side-impacts.	41,876	8,108	-----
R-G-7051.....	Dr. Edward J. Shoben, Jr., Teachers College, Columbia University.	Development of a criterion for driver behavior.	26,179	-----	-----
R-G-7385.....	Dr. James L. Malfetti, Teachers College, Columbia University.	Measuring teacher effectiveness in driver education.	18,315	-----	-----
R-G-7958.....	Dr. Leon G. Goldstein, George Washington University.	Group dynamic study of driver attitudes and driving behavior.	90,000	90,000	-----
M-1028 (SSS-AP).....	Dr. Alexander J. Tuttle, Connecticut State Department of Health.	Family injury survey.	56,580	-----	-----
M-2407 (SSS-AP).....	Dr. Saad S. Gadalla, University of Missouri.	Selected environmental and human factors associated with incidence of farm accidents in Missouri.	51,141	-----	-----
M-4945 (SSS-AP).....	Cyrus M. York, American Institute for Research.	Visual signal conspicuity.	2,300	-----	-----
M-2353 (SSS-AP).....	Dr. J. P. Gullford, University of Southern California.	California accident-re,ater drivers scales.	10,745	-----	-----
Total.....			1,258,625	558,262	312,553

Secretary RIBICOFF. I would like to make one further comment on your statement before Dr. Chapman talks about the simulator.

I think you are absolutely right on the track, Mr. Roberts.

I feel that it is too bad that a bill like this even has to come into being, because I would hope that the automotive industry, on its own, would automatically, as soon as any safety feature came into being, put it into the automobile as standard equipment.

I do not think that there is any question that we are engineering too many fancy frills into automobiles. And there are many other factors that are safety factors that could go in and are not going in.

We also keep in mind that the best automobile is not the fanciest automobile, and yet if the automobile industry does not take this lead I am sure that under a measure such as this, once the Federal Government writes it into its specifications for the automobiles it purchases, as you have pointed out, it will require them to put in the equipment, and it will be hard for the automobile industry to refuse to put it in their cars as standard equipment to be sold to every American who wants to drive an automobile.

That is why, frankly, I am so happy to see what you are doing, because I think you are breaking important ground. And what you will accomplish by such a measure could lead to many safety features for the welfare of all of the people and I am sure will save many lives of fellow Americans.

You may be assured of my personal, insofar as the Department is concerned, complete cooperation with your committee in trying to accomplish the objectives this committee has in mind.

Dr. CHAPMAN. I can say in answer to your question, that in 1958, upon the advice of experts, the Public Health Service contracted with Cornell Aeronautical Research Laboratory to conduct feasibility studies to determine whether it was feasible to conduct and develop a "true" simulator. Upon their advice, it was agreed that such a simulator was feasible.

At that time, however, there was a great lack of appreciation of what a simulator was. Many people confused it with training devices. And it was for that reason that, with the cooperation of the Bureau of Public Roads and under the aegis of the Automotive Safety Foundation, a conference was called last February in Santa Monica, Calif., where many of the experts who had worked on simulation devices in the aircraft industry and in other fields met, together with other research workers who were not so well informed, and discussed the potentialities of simulation; that is, broad simulation techniques, rather than merely a true simulator. It was from that conference that a better understanding of the role of the need, not only for true simulation, but also for part-time simulators, came.

In preparation for this conference, we conducted a simulation study in Connecticut. It dealt with firemen who volunteered to go without sleep for 24 hours, to compare their performance after the 24-hour lack of sleep and their ability to perform these tasks prior to that. Of course, there was a great degradation of ability in performing these assigned tasks.

They found a conflict in the results with the use of alcohol. They gave the alcohol in amounts that would raise the blood level to 0.05. The volunteers did not know who received the intoxicants. We found a great conflict there.

Some of those who did not get any alcohol had decreased ability to do the tasks. They convinced themselves that they were intoxicated, shall we say. And some of those who got the alcohol did not show the expected degradation of reaction. So this calls attention to the need for precise research in that area and for not jumping to conclusions.

Other tests were done.

The end result is, I believe, that the beginnings have been made in simulation devices. And if additional research grants are provided, the partially developed simulators can become true simulators within a very short period of time.

Mr. ROBERTS. I am glad to have that explanation, because, frankly, to my knowledge the simulator I felt was pretty well confined to efforts, I believe, which were under study for some time and the building of one that could be made available and it should be made available to the schools throughout the country and to have an adequate course in driving education.

Those are all of the questions the Chair has. Are there any questions from the members?

Mr. SCHENCK. Mr. Chairman, I would like sincerely to commend my good friend, Secretary Ribicoff, for the splendid work he is doing and for his excellent statement, all of which is most encouraging to the members of this subcommittee.

I should, also, like to thank him and to commend him for his very effective statement off the cuff, if you please, to this very fine group of high school students from Vera Beach.

I notice that on pages 13 and 14 of your statement, Mr. Secretary, you referred under the caption, "Information Exchange," to the advantage of the exchange of information, probably through your Department, I am wondering if you could explain how the communities could take advantage of studies made in other communities.

Secretary RIBICOFF. I have found this, that there is a great, great interest, sir, in this whole field of highway safety. This is a concern of every mayor, of every Governor, and of every thinking citizen. The press is very much interested in highway safety. Highway safety drives are going on in all of the 50 States. Citizens and public officials are equally concerned.

Many people are duplicating their work. Community A over a period of years has tried a method that has either succeeded or failed and community B decides, on its own, without ever knowing, that it is going to use this method. It might save a lot of money and time if it knew that past experience has indicated its success or failure.

Once the Department collates all of this information together we will invite communities and States, mayors and Governors, etc., who are interested in highway safety not to hesitate either to come to Washington personally or to write to us telling us what they are interested in trying to do, asking for information; and to have a library established with pamphlets, with tables, with methods, with pictures, with experience of what has been done and the results. And, therefore, with this clearing house in the Federal Government and accessibility to it, you will find that the good methods will be adopted and the bad methods will be rejected.

It is something that could do an incalculable good for every community in this country because I do not think there is a man or a woman in America who has not directly or indirectly been affected by an accident. Many of us have lost close relatives. The papers each day in every community in America list the highway deaths of people known to everybody else in the community.

The fantastic cost of insurance each year goes up and up and up, until it gets so that it is becoming economically very, very tough to drive a car, if you have a sense of responsibility and you want to take care of a person who is injured. If we are not careful and do not reduce the cost of highway accidents—if we do not eliminate the deaths, we are going to find that the automobile, instead of being a boom, is just a curse. An automobile is a boon, but we must make sure that we eliminate many of these hazards.

I think, Congressman Schenck, that you have put your finger in a very simple way on one of the most important phases of the question of giving information to whoever wants it. And I think that America wants it.

I did find in my period as Governor, interested in this field, that newspaper editors, Governors, mayors, from all over the United States, used to come to Hartford to talk about these problems, to see what we wanted to do, what we were trying to do, and where we were successful and where we had failed. There is so much interest in highway safety that once this gets a boost from the Federal Government—once the people in whom this committee is interested know that our Department is available to help, I think that we would start accomplishing some plus factors in this whole field.

Mr. SCHENCK. I might say that I think the public relations people in your Department should make sure that these various reports of studies would go to municipal and State officials and associations of municipal and State officials so that they may be informed as to the availability of this information in your Department. I think this information should be made available when you have had an opportunity to set up your library and information for them.

Secretary RIBICOFF. Of course, we will always work very closely with the National Safety Council which does an excellent job. I do not want you to think that the Government will do the whole job.

I think much of the experimentation and research that are being done will be available to the fullest extent possible. We would want to continue a cooperative effort with private agencies in this field, such as the Automotive Safety Foundation, the National Safety Council, and other groups who are doing an excellent job in this field.

But I think that all of us coordinating our efforts would be very helpful in this field.

Mr. SCHENCK. And, perhaps, the publication of the availability of this in the so-called trade journal would be helpful.

Secretary RIBICOFF. And also, the State public health officials and our own Public Health Service officials are out among the States. They can be making this information available to all of the State people. In other words, our public health services, all over the United States can be helpful. As information is developed, it will be made available to the Governors of our States and to the municipalities who I know are very anxious to do their part. I have not known a Governor in the 50 States who is not vitally interested in this field.

And the mayors of the cities and others are interested in the work that is being done here.

Mr. SCHENCK. I want again to express my appreciation to Secretary Ribicoff for this very effective and helpful work that he is doing.

Mr. ROGERS of Florida. I, too, appreciate the statement of the Secretary and the interest that you have in this subject which, I think, will be shown in the work that follows.

I have a feeling, however, that, perhaps, we could do more than act as an information center. I realize the importance of that, but I have the feeling, and I have been in this field and have worked with it, certainly, for some time. I know that your work has been outstanding on this subject.

It seems to me that we really are not concentrating enough yet on safety first in this whole problem.

I notice in your statement on page 9 where you say :

Today the Public Health Service has no facilities for conducting intra-mural research in accident causation similar to the intra-mural research facilities that are available to other national research centers, such as the National Institutes of Health.

It seems to me that this research would be a proper thing for the Federal Government to do basic research on. We want to find out what the real problems are, instead of a rather hit and miss program as it is thus far.

I wonder what the Secretary might think about expanding this sort of program and, perhaps, developing some facilities for our doing some research along these lines, rather than putting out a basic grant here and there which is done in the health field. I know that you place grants among various colleges and universities and I know that is very effective and necessary, but I still do not think that we are taking the leadership in getting to the core of the problem by simply saying, "We are going to put out some pamphlets and send out some men and have them talk a little bit about it." I think we have to meet the problem head on and actually do some research to solve these problems.

Here are 40,000 people who die by automobile accidents. We do not yet have any facilities in the Federal Government to research these problems and to find out the real causes and what can be done about them.

Secretary RIBICOFF. I think that you are right. First, may I say I have been Secretary only since January 20.

Mr. ROGERS of Florida. I realize that. I realize that. I am not criticizing you.

Secretary RIBICOFF. Basically, I would say that I think you are on the right track. Of course, to be able to do this we will have to have some more funds, you understand.

Mr. ROGERS of Florida. Yes.

Secretary RIBICOFF. I think you might be interested in this list which I have asked to be included in the record. As I run my eye down the list on the grants, I notice that there are listed Cornell University, Northwestern, Harvard, Michigan State, Public Health Institute, State of California, Michigan State, University of Minnesota, University of Michigan, Wayne State University, Flight Safety Foundation, Department of Health, Honolulu, Michigan State, New York University, University of California-Los Angeles, International

Association of Chiefs of Police, University of California, Columbia University, George Washington University, et cetera. In other words, you will be very much interested in seeing the amount of research through these grants that we are doing.

Of course, there are many universities and many people vitally interested in this field, and we should encourage them to do as much as possible.

I would believe and I would hope frankly, I would want this whole job to be done to the fullest extent possible that we can and to have the outside cooperation with universities and colleges that would like to cooperate. I do think that there is much more that can be done on an intramural basis, which we would like to do.

Mr. ROGERS of Florida. I would not expect everything to be done here, but in drawing an analysis in the health field, we still have our facilities here which are developing dynamic progress. At the same time we are carrying out all of the grants in other universities in various fields. We have put emphasis upon that matter.

What, for instance, is the budget now for accident prevention research? I think that you said \$1 million was allocated in 1961. I am wondering what the actual budget for research is.

Dr. CHAPMAN. \$1,400,000, approximately, this year. We can place the exact figure in the record.

Mr. ROGERS of Florida. It would be helpful to have that information.

Dr. CHAPMAN. We can supply the exact amount for the record.

(The information follows:)

Basic research grants in fiscal year 1961 totaled \$1,482,000. Of the 33 research projects supported in 1961, 23 deal directly with various phases of traffic accident research.

Mr. ROGERS of Florida. We have millions and millions of dollars being spent for research on health. We have 40,000 deaths with 4 million people injured every year and our budget is \$1,400,000, roughly. I see that you have 122 people in accident prevention. You just came on the scene, I understand. I was pointing out some of the things that concern, and how little we have been doing does concern me.

Secretary RIBICOFF. I think in all fairness, let me say this, I do not think that you are ever going to find the touchstone, the panacea to solve this entire problem. In all candor you have a human factor. And you never know what any man is going to do at any given time under any given circumstance. There is so much that has to be done.

There is the question of enforcement. No matter what research you do here, if the courts will not prosecute, if the police will not arrest and the arrested people are let out, the people are not educated. And if you do not take the students that we had here in the room this morning and give them good driving habits, you will lose much. You do not take advantage of the way you build roads. After all, with the amount of traffic, and the types of cars that you have, there are many factors of engineering that you can put into the roads themselves.

There is the question of reciprocity between States, and the question of what the Roberts bill is aiming at right now, safety devices, at least, to minimize the severity of the injury in case of accident. There are all of these factors.

No matter what research you do, you will always have accidents. I think we should do everything we possibly can to minimize the accidents. There is no easy way to solve it. I think that we would be making a big mistake if we let people believe that there is one answer to accident prevention. We must do everything we can to minimize and to decrease accidents.

And as fast as these ideas come, whether they come from the States or come from research or come from this committee, we should try to put them into effect.

Mr. ROGERS of Florida. I agree with that. Certainly, we cannot find an answer with respect to all of it. The question is whether we are doing enough basic research to find out what we should do to try to funnel information out and make it available to those who are interested in doing something. For instance, I think that research on the safety factors on the cars alone, probably, could do a great deal. It is starting now, I think. Like we say in this bill, this is a right step in that direction.

I was glad to see your statement on air pollution, which, I think, is a very necessary thing. That action has come about from the last Congress, because we started to assert some leadership in this particular field.

Mr. ROBERTS. If you will yield, I should like to have inserted in the record a statement in the Sunday Star of April 16 by Secretary Ribicoff.

(The statement follows:)

[From the Sunday Star, Apr. 16, 1961]

RIBICOFF ASKS FUMES CONTROL

Welfare Secretary Ribicoff wants the auto manufacturers to install devices on new cars to cut down exhaust fumes.

If the auto industry doesn't act voluntarily to make the device standard equipment, Mr. Ribicoff said yesterday "then legislation to require it should be considered."

Mr. Ribicoff's predecessor, Arthur S. Flemming, also had said the device should be made standard equipment. The auto manufacturers, according to an HEW spokesman, refused to put the device on all cars but agreed to make it optional.

The device was put on cars to be sold in California, which has been struggling with "smog" problems for the past 10 years. Some cars with this device have reached Washington and buyers have paid the extra few dollars for it without knowing that they were thus contributing to cutting down air pollution in the Nation's Capital.

The gadget goes by various names, such as crankcase ventilation control device or blowby device. It diverts fumes of crankcase back into the engine to be reburned.

It was reported that a car manufacturer reported in 1959 that crankcase blowby is responsible for from a quarter to a third of the total pollution from car fumes. When this report was tested in Los Angeles County and by Public Health Service research officials, it was found that a significant portion of car fumes comes from this source.

Mr. ROGERS of Florida. I wanted for a minute to go into this question. According to the statement, 122 people have been assigned to your accident division. I notice that 34 are engaged, primarily, in

traffic accident prevention activities. What mainly are the other personnel concerned with?

Dr. CHAPMAN. Traditionally, Public Health has been concerned with home safety for a number of years. It was not until 1956-57 that they finally broke through the barrier and became interested in traffic safety. So naturally, in relating our activities to the current activities in the States, we are more active, or have been traditionally, in home safety and in farm safety and in these other types of safety activity rather than in motor vehicle safety, but the contribution we are making, percentagewise, is growing much more rapidly in the motor vehicle field in the last few years.

Mr. ROGERS of Florida. What is your budget for these other safety activities?

Dr. CHAPMAN. That amounts approximately to \$1,300,000. We can insert the exact amount in the record.

Mr. ROGERS of Florida. If you will do so.

Dr. CHAPMAN. We will.

(The information referred to follows:)

For direct operations in fiscal year 1961, including \$1,440,300 was allocated, \$643,400 for traffic accident prevention.

Of the 122 full-time employees, 34 are in traffic safety work.

Mr. ROGERS of Florida. In other words, you are speaking about \$1,300,000 for other accident work?

Dr. CHAPMAN. That is for direct operation, about one-third of which is on motor vehicle safety activity. About two-thirds of the basic research funds are spent on motor vehicle safety research. About one-third of the funds for application is spent on the study of highway accidents, that is, one-third of direct operation funds. Do you see what I mean?

Mr. ROGERS of Florida. Give me that again.

Dr. CHAPMAN. We have a research budget of \$1,400,000, covering 33 projects. About 23 are directed toward highway safety research.

Mr. ROGERS of Florida. Yes?

Dr. CHAPMAN. We have about \$1,400,000 for direct operation. Of this amount, about one-third is spent on highway safety activity.

Mr. ROGERS of Florida. What percentage of the accidents are caused by automobiles; that is of the total accidents?

Dr. CHAPMAN. Motor vehicle accidents cause about 40 percent of the deaths each year, but home accidents cause the great majority of injuries. In other words, motor vehicle accidents tend to be more fatal, accident for accident, than home accidents are.

Mr. ROGERS of Florida. And there are about 4 million accidents, I believe, from automobiles each year.

Dr. CHAPMAN. There are 40,000 deaths.

Mr. ROGERS of Florida. Yes.

Dr. CHAPMAN. And a little over 4 million injuries from automobile accidents.

Mr. ROGERS of Florida. I just wanted to say that I hoped in this study you would give some thoughts to increasing your basic research on these problems.

I am glad that the Secretary has gone into this subject and has taken a very vital interest in it. With 40,000 deaths a year, this is certainly one of the major fields that needs research and leadership from the Federal Government.

Secretary RIBICOFF. At this point, I would like to place in the record, Congressman Roberts, the statistical summaries that would give the answers to the questions you just asked. You will have it for the purposes of the record.

(The document referred to follows:)

ACCIDENT PREVENTION PROGRAM—STATISTICAL SUMMARY

Director of program: Dr. Paul V. Joliet.

Organization (June 30, 1960)

Unit:	Employees
Office of Chief.....	7
Operational research.....	13
Program services.....	13
National clearinghouse for poison control centers.....	5

Personnel (as of June 30)

	1957	1958	1959	1960	1961 (estimated)
Paid employment.....	5	43	37	38	128
In District of Columbia area.....	4	37	32	32	87
Outside District of Columbia area.....	1	6	5	6	41

Funds (fiscal year)

[In thousands]

	1957	1958	1959	1960	1961 (estimated)
Total available.....	49	318	325	355	1,271
Appropriations.....	49	4	4	16	34
Transfer.....		4	4	16	34
Funds available for: Direct operations.....	49	318	325	355	1,271

Program statistics (United States; years indicated)

	1955	1956	1957	1958	1959 (estimated)
Accidental deaths:					
All accidents.....	93,443	94,780	95,307	90,604	89,350
Motor vehicle.....	38,426	39,628	38,702	36,981	35,320
Home.....	22,935	22,630	22,772	22,749	23,800
Other and unspecified.....	32,082	32,522	33,833	30,874	30,230

Accidental deaths as percent of all deaths by age

	1954	1955	1956	1957	1958
Under 1.....	3.35	3.09	3.23	3.29	3.44
1 to 4.....	28.35	28.72	28.16	27.68	27.75
5 to 14.....	40.53	41.60	42.39	41.67	41.94
15 to 24.....	49.89	52.40	55.09	51.75	52.27
25 to 34.....	28.89	30.44	30.77	30.07	28.86
35 to 44.....	13.52	14.35	14.51	14.24	13.88
45 to 54.....	6.50	6.89	6.86	6.74	6.27
55 and over.....	3.23	3.19	3.11	3.01	2.74

Estimated number of persons injured (July 1957 to June 1958)

[Numbers in thousands]

	All ages	Under 5	5 to 14	15 to 24	25 to 44	45 to 64	65 and over
All accidents.....	46,919	5,641	10,830	7,040	11,332	8,451	3,625
Motor vehicle.....	4,702	120	323	1,214	1,669	1,081	296
While at work.....	8,150	-----	178	1,464	3,755	2,471	282
Home.....	19,137	3,832	5,732	1,311	3,180	2,536	2,545
Other and unknown.....	14,930	1,689	4,598	3,051	2,728	2,333	501

Mr. ROBERTS. Thank you very much.

Secretary RIBICOFF. I agree with you again. Frankly, I have always been excited about what the Roberts committee has been doing. I do not know whether you realize yourself the real impact and importance of the work that you do here—I mean, the leadership in this field, the nationwide leadership.

This leadership that comes out of this committee, in every phase in the field that you have touched, in it you affect the life and the welfare of practically every man, woman, and child in America, and you may be assured of my close cooperation, working together with this committee to try to work out an effective program in the field encompassed by this committee for the future welfare of all of our people.

I do look forward in the years ahead to working very closely with this committee.

Mr. ROBERTS. Thank you.

Mr. NELSEN. Mr. Secretary, has there ever been any coordination of some of these recommendations of these various research groups? For example, has there ever been an attempt made to assemble an automobile with the maximum of safety factors installed in the machine? Perhaps the Government could provide leadership by purchasing some of these machines—setting a good example for the public. Has there ever been anything like that done?

Secretary RIBICOFF. No. A few years ago, I would say 1958, the Governors' Committee on Highway Safety of which I was chairman, went to Detroit and talked not only to the engineers, but to the presidents of all of the major automobile companies. I think it is one of the few times that they all came together—I mean not only did we visit the plants and the experimental yards of every major automobile company, but we sat down with all of their top people to discuss this problem.

They are all doing work in this field, some very interesting work.

On safety devices, I do not think that any manufacturer wants a monopoly. He is willing to exchange his information with the other manufacturers.

I think that they move too slowly in putting these into effect.

My feeling is this, and I would make a prediction, that when Detroit knows that Washington means business, through the efforts of your committee and the Congress, that much of this will never have to get into law, that they, too, will realize the basic interest of the people of the United States, speaking through you gentlemen—my prediction is that when this takes place, Detroit on its own will do this, because looking back from the standpoint of my research,

about 10 percent of the cost of every automobile today goes into engineering fancy frills, in the price of a car. They are the so-called parasitic parts that are not necessary to run the automobile.

Let us say that if you take an automobile that costs \$2,500, that amounts to \$250. You take the safety factors you gentlemen are talking about; what do they cost? About \$50, maybe, in the cost of a car—\$50 or \$60.

Once the American people know that for \$50 or \$60 they can get some of these safety features, they will be willing to give up the fancy gadgets.

Let us not kid ourselves. You have them in your car and I have them in my car, but we get no use from them, although we pay for them.

I think there is such a realization in the fact that Detroit has gone into the manufacture of the small automobile. I think that once they know that this committee means business and is going to push these things through the Congress, you will find that they will suddenly realize the time has come to put these things into automobiles. It is commonsense; it is good business. And I think that just that awareness will bring good results. This is my prediction.

And if this takes place, I think this committee is due a lot of credit from the people of America.

Mr. NELSEN. That is all. Thank you.

Mr. THOMSON. I have no questions. I have enjoyed hearing the Secretary again. I thought he sparkled when he talked to the group from Vero Beach.

Secretary RIBICOFF. I am always glad to see one of my former colleagues. I am glad to see you again, Governor Thomson.

Mr. THOMSON. Thank you.

Mr. ROBERTS. We are glad to have the chairman of our full committee with us today. We shall be glad to hear from him, if he has any comments to make.

Mr. HARRIS. Thank you, Mr. Roberts.

Mr. SECRETARY. I just want to say that I am sorry that I was otherwise engaged and could not be here for the presentation of your statement this morning. I am pleased to observe, of course, the statement you have made regarding automobile exhaust fumes and the publicity given it in the newspapers.

I, too, want to say that I believe that this subcommittee is deserving of a lot of credit—the major credit—for the progress that has been made in this field.

I know the difficulties they were having in this work when I first became chairman of this committee; however, they have labored with this question hard and long and have been patient, and over the years have accomplished a great deal.

If, by installing this blowby device, some fumes can be eliminated as has been done in California, it can be done in Pittsburgh. It can be done in Washington.

Incidentally, when I read your statement to the press regarding exhaust fumes, I wondered if something could not be done to control these fumes from our buses, as well as passenger cars.

I noticed in connection with this report that these blowby devices can be installed at the time of manufacture for \$4.50 or \$5.

If that can be done, it should be. This committee, over the years, has emphasized that. It would prevent this condition in other places in the United States. It would help prevent their experiencing the same conditions now found in California.

I have been out there the last couple of years and experienced that condition myself. I thought that it would not affect me, but before we left, one day it hit me, too.

I think what you are doing in backing up what the committee is trying to do is of tremendous benefit to the industry itself.

If such an instrument could be put on my car, I would prefer that they put it on. And I imagine that most of the automobile drivers of the country would welcome it, too.

I thank you, as chairman of the committee, for your attention to this and the assistance you have given to the committee.

Thank you, Mr. Roberts.

MR. ROBERTS. The Chair, I am sure, expresses the sentiments of the members of the subcommittee in thanking you for your continued support in the work of this subcommittee.

We are always happy to have our chairman sit with us at any time.

Again I want to thank you, Mr. Secretary, for your statement and to say we especially appreciate your support in the form of the report on H.R. 1341 and your offer of support to the committee in its activities.

We appreciate it very much, and the information you have given and the time you have given to the work before the committee.

Secretary RIBICOFF. Thank you. It was a pleasure to be here, Mr. Chairman. May I say that I am as close to you as the telephone in case there is any question in your mind, Mr. Chairman, or the committee's.

As I said, before the chairman of the full committee came in, from my knowledge of the Department, the various problems that funnel through this whole committee in various phases, they are some of the most important and weighty for the internal progress and well-being of our Nation. And that is why I am so thrilled to be working together with a group of people so interested, because I think with cooperation between the Congress and the executive branch in this field, much good can be accomplished for all of our people, not only back in your own districts, but the people in the entire Nation.

And keep this in mind, that it might be very interesting to know that when you talk about the problems of highway traffic and the problems of safety, while the record in the United States may be bad, it is still much better than the record of any other nation in the world. You will find that what you do here will not only have an impact in the United States, but will be followed by every nation in the world. During the period that I was working in this field in Connecticut I was also visited and received inquiries from foreign nations and representatives of the press from all over the world, who are deeply concerned. The lead that this committee will be taking not only will be one for the people of the United States, but you will find that all over the world people will be beating a path to your door to find out what you are doing. So, therefore, you are really affecting the health of the people and the future people all over the world, as well as those in the United States.

Mr. ROBERTS. I might say, going back to the effect that this committee has had in the safety picture, we have been all over this country studying this problem. I have had wonderful help from my colleagues on this committee. I believe that one of the forward steps which has been taken by this industry goes back to the hearing on H.R. 1341 when the industry pledged itself to so manufacture their cars that seat belts could be attached at a very small cost, that is, in all the 1962 models. The cars will be manufactured so that these belts can be placed on them at a very small cost.

I might say, too, that last Thursday afternoon I was advised to be present at the General Federation of Women's Clubs consisting of, I believe, 16,000 clubs and 5½ million women, who are going to try to get safety belts on as many cars as they possibly can. And this, too, is being sponsored, I think, by the Automobile Manufacturers Association, NADA, and the Auto Industries Highway Safety Committee, Inc.

I think we had a great deal to do with getting this.

Again, I want to thank you for your appearance here today.

Secretary RIBICOFF. Thank you again.

Mr. ROBERTS. Our next witness is Mr. John L. Moore, Administrator of the General Services Administration. We are always happy to have you before the committee.

STATEMENT OF JOHN L. MOORE, ADMINISTRATOR, GENERAL SERVICES ADMINISTRATION; ACCOMPANIED BY J. W. FLATLEY, ASSISTANT COMMISSIONER, OFFICE OF PROPERTY MANAGEMENT; S. O. FARRIS, DEPUTY COMMISSIONER, MOTOR EQUIPMENT; AND A. C. MCKINNEY, JR., INDUSTRIAL SUPPLIES AND EQUIPMENT BRANCH CHIEF, NATIONAL BUYING DIVISION, FEDERAL SUPPLIES SERVICE, GENERAL SERVICES ADMINISTRATION

Mr. MOORE. Mr. Chairman and gentlemen, I have with me three gentlemen, Mr. Flatley, Mr. Farris, and Mr. McKinney, Jr.; I am not experienced on the subject of safety as was the Secretary who preceded me. I have a general statement which is not too lengthy and I shall endeavor to go through that as rapidly as possible.

I am John L. Moore, Administrator of General Services. I am here today at your request to discuss with you and your subcommittee the Federal Government's responsibility in protecting persons and property in interstate commerce from highway accidents. You have asked that I give you the benefit of my views as to what the Federal Government, and specifically, General Services Administration, can and should do to prevent such accidents.

First, let me say that I welcome the opportunity you have afforded me to discuss with you ways and means of combating the tragic toll of highway traffic deaths and injuries.

Second, I wish to take this means of expressing my appreciation for the interest you and your subcommittee are taking in protecting persons and property from highway accidents and the painstaking study you have been making of highway safety problems. As Administrator of General Services, I want you to know that I share this interest and concern with you and assure you of my full cooperation.

Third, Mr. Chairman, I would like, at this point, to make a brief comment with respect to your bill, H.R. 1341, to require passenger-carrying motor vehicles purchased for use by the Federal Government to meet certain safety standards.

On March 28, 1961, we submitted a report on this bill to the chairman of the House Committee on Interstate and Foreign Commerce. We took the position that enactment of such legislation would not be necessary since the General Services Administration already has technical authority to prescribe motor vehicle procurement standards. With your permission, Mr. Chairman, we wish, at this time, to submit a revised report on H.R. 1341. In view of the fact that there may be a beneficial effect from the enactment of legislation which would clearly define the responsibility of establishing requirements for safety devices to be installed in motor vehicles sold to the Federal Government, General Services Administration would have no objection to the enactment of H.R. 1341 if the bill were amended by striking the words "Secretary of Commerce" in lines 7 and 10 on page 1 and inserting in lieu thereof the words "Administrator of General Services."

The reason we have asked for that specific change—and this I understand has been completely agreed upon by the Department of Commerce and the Department of Health, Education, and Welfare—is that there should be only one agency within the Government prescribing these standards and specifications for the purchase of vehicles.

There is another matter in relation to the change of the statutory limitation as to the amount of money that we can spend for automobiles and station wagons. And if someone else were prescribing safety regulations we might not be able to comply with those standards because of the lack of funds.

As you know, the General Services Administration establishes procurement standards for motor vehicles purchased for use by the executive branch of the Government, which standards must be observed by other branches of the Government as well. In doing so we have continually kept safety in mind as one of the major objectives of the procurement standards. We are, of course, limited to those safety accessories which the manufacturers provide as standard optional equipment, since the Government's purchase of approximately 10,000 passenger cars per year represents only about 0.2 percent of the new passenger car sales in the United States. The present procurement standards require that each passenger car sold to the Federal Government has safety glass; dual constant speed windshield wipers; ash trays; horn ring or bar; dual horns, two sun visors; windshield washers; fresh air heater and defroster; turn signals; inside rearview mirror of the glare-reducing type; and an outside rearview mirror. Furthermore, I am happy to advise you and the members of the subcommittee that we are now adding a requirement for seat belt anchors, front and rear, to the procurement standards for passenger vehicles. Optional accessories which the requesting agencies may order include seat belts; nylon tires, where the service requirements justify their use; and in the case of law enforcement vehicles, engines of greater horsepower; padded visors and dashboard; special tires and tubes; flasher lights; and power steering and brakes.

So far, with the exception of law enforcement vehicles, we have been able to procure vehicles within the present statutory price limitation of \$1,500 for passenger cars and \$1,950 for station wagons equipped with such added accessory items as the agencies have requested. Generally, the law enforcement agencies are permitted to exceed the price limitation for the estimate cost of certain optional items. However, under the existing price limitation, there is very little latitude for adding other safety devices. As such items are proven, the General Services Administration will take action to include them in the standards and to request sufficient change in the maximum price limitation to permit their purchase. These actions must, of course, be concurrent to preclude the standards requiring items which cannot be obtained within the price limitation.

In developing motor vehicle procurement standards we utilize the standards of the American Standards Association; the Society of Automotive Engineers; the American Society of Testing Materials; and the available research findings of the Bureau of Standards and the Ordnance Tank Automotive Command of the Department of the Army. We also solicit the advice of the other Government agencies and of the vehicle manufacturers. As you know, Executive Order 10898, dated December 2, 1960, established the Interdepartmental Highway Safety Board, which, we understand, is now becoming operative. In the future in developing standards we will seek the advice and counsel of this Board.

During the past 20 years there has been considerable progress in the area of traffic safety. This is borne out by the National Safety Council's statistics which reflect that in 1941 there were 34,894,000 vehicles registered in the United States. These vehicles operated 334 billion miles and killed 39,869 people—which is a death rate of 12 for each 100 million miles of operation. In 1960 there were 73,900,000 vehicles registered. They operated 700 billion miles and the motor vehicle accident deaths were 38,200—a death frequency rate of 5.3 for each 100 million miles of operation, a decrease in the death rate in excess of 50 percent. Admittedly, this is still a gruesome record and every effort possible must be made to prevent the loss of life and bodily injury resulting from traffic accidents. This frequently reduction has come chiefly from improved highways, improved equipment, and improved law enforcement. During this 20-year period very little concerted effort has been expended toward improving the skill of the driver. In General Services Administration, we have developed an Operator's Handbook and also a 10-hour training course for our motor vehicle operators. This course in its entirety, or modified to meet local conditions, has been given to each GSA driver. On March 24, 1961, GSA Circular 234 advised the heads of Federal agencies of the availability of the handbook and also of the availability of Instructor's Guidelines for the 10-hour training course. I have a copy of each which I would like to submit for the record. It is GSA's opinion that the next major advancement that must be made in reducing traffic accidents and traffic fatalities is to improve the defensive driving skill of not only the Federal vehicle driver, but of all people driving motor vehicles. To this end, we believe that research along the human engineering lines must be expedited and emphasized to the full extent practicable.

In concluding my prepared statement, Mr. Chairman, I should like to introduce the following members of my staff who have accompanied me for the purpose of furnishing any additional information you or members of your subcommittee may desire or answering any questions you may wish to ask.

I certainly agree with the statement of the Secretary of Health, Education, and Welfare, who preceded me, that in matters of research in this field, we in General Services Administration have no research funds for this purpose, for the purpose of safety, and we will be glad to assist and cooperate with other agencies engaged in research to the fullest extent possible.

As I said earlier, we are in full sympathy with the intent of the committee. We certainly wish to do everything that we can do to improve the safety of driving on the highways, relieving the painful and horrible accidents which are taking place today.

I, and the gentlemen who are with me, will be glad to answer any questions possible, and I shall submit, if it meets with your pleasure, this report for the record.

Mr. ROBERTS. That may be done. It will be made a part of the record, without objection.

Thank you, Mr. Moore. I realize that this is a new field. Of course, I am not asking you to accept the responsibility or to rationalize this action, but what we are trying to do here is to set up a policy. The policy is for the Federal Government to protect its employees, and also, incidentally, to give the Federal Government leadership in the field of safety devices. This is the type of leadership in aviation safety, in food and drugs, and in the inspection of meat, in railroad safety, and in maritime safety.

It will give the people of this country something to pattern after; therefore it will save many lives and avoid many injuries.

I realize there is a little difference of opinion to the procedure to be followed. The General Services Administration is a procurement agency and naturally feels that it must purchase cars from the industry for the use of various employees of your Department and other Departments and agencies.

Do you have any sort of technical setup, such as the Bureau of Standards, for testing devices and equipment? Do you have such a group in General Services Administration?

Mr. MOORE. I will let Mr. Flatley answer that.

Mr. FLATLEY. I am one of Mr. Moore's assistants. We have a Standards Division that is responsible for the promulgation of Federal specifications under Mr. Moore's direction. We work cooperatively with all agencies of Government, more particularly with the Bureau of Standards in this specific area.

Mr. ROBERTS. Is it not true that, as a rule, you adopt standards that have already been passed on by groups such as the Society of Automotive Engineers?

Mr. FLATLEY. We serve as the coordinating agency. In order to arrive at a uniform position for the Federal Government, and under Mr. Moore's jurisdiction, we promulgate those standards. We have no research facilities as such within General Services Administration.

Mr. ROBERTS. That is the point I wanted to make. Actually what we are seeking to do here is to find out what devices are lifesaving

and what devices can be used that have been proved through testing should be on these automobiles.

There is one statement you made, Mr. Moore, in your prepared statement, on page 3, where you say:

There is very little latitude for adding other safety devices.

That follows the gist of the views you have given the committee as being true with specifications.

Mr. FLATLEY. Under that particular statement, that was pointing up the present statutory limitations. We are presently paying on the order of \$1,495 for vehicles, and we only have a spread there of \$5. We can, of course, appeal to the Congress to get that raised, if people like the Department of Health, Education, and Welfare recommend new standards to us.

Mr. MOORE. It would seem to me, Mr. Roberts, that if we had a recommendation from some of the other agencies that would be acceptable to the Congress, then this would give us an opportunity to have the ceiling raised. And as has been stated by Mr. Flatley, there is a \$5 leeway which would mean that we could not provide very much in the way of any safety devices for any purposes whatsoever.

Mr. ROBERTS. That is correct. There is the fact that many of these devices can be made at the same cost as those presently on the cars; in other words, a safety-type lock would not require any more steel, (perhaps, than one that is being used at the present time that is not safe.

The same would be true with reference to the steering wheel that presently is felt to be unsafe by some people who work in research fields. It would require, perhaps, no more cost or costly material to build a safety-type steering wheel.

That would not apply to things like crash padding and other devices that may have to be put on and have to be incorporated in the cars.

Mr. SCHENCK. Would you yield there for a question along the line of the other feature?

Mr. ROBERTS. Yes.

Mr. SCHENCK. I am wondering if Mr. Moore would suggest that the ceiling be raised universally across the board, or whether some provision be made to pay for the additional safety equipment which is approved.

Mr. MOORE. Well, I would believe that it would need to be raised across the board, because if we standardize it for all of the agencies, we would need to have an across-the-board raise.

Mr. SCHENCK. Thank you.

Mr. HARRIS. Who establishes the ceiling at present?

Mr. MOORE. It is statutory—by Congress.

Mr. FLATLEY. The Appropriations Committee has always taken the leadership in establishing it in that particular area. For over 20 years, the Congress has established the statutory price on passenger-carrying vehicles. It is the only item of supply on which there is a statutory limitation.

Mr. HARRIS. What is the statutory limitation, or ceiling?

Mr. MOORE. On passenger cars, it is \$1,500, and on station wagons, it is \$1,950.

Mr. HARRIS. What kind of passenger car do you get for \$1,500?

Mr. FLATLEY. We get the standard six-cylinder Ford, Chevrolet, and Plymouth. For the past 6 months, Plymouth is the only one of the Big Three that has been bidding to us. But Rambler and Studebaker have been successful bidders within the past 3 months.

Mr. HARRIS. Do you get a special factory price?

Mr. FLATLEY. Yes, sir. We buy all of our vehicles f.o.b. factory.

Mr. HARRIS. Who establishes the standard equipment which you have indicated here?

Mr. FLATLEY. General Services Administration establishes the standard specifications for the invitations to bid under which we buy this equipment.

Mr. HARRIS. As an example, why have dual horns?

Mr. FLATLEY. I will let Mr. Farris tell you about that from the technical angle.

Mr. FARRIS. To get a signal which can be heard, to improve the quality and the loudness of the signal. Horns are not of very much value unless the person you are blowing it at can hear it.

Mr. HARRIS. Why have more than one horn? You do not have to have more than one.

Mr. FARRIS. That is right.

Mr. HARRIS. Has it been determined that it is necessary to have dual horns for the other man to hear?

Mr. FARRIS. That, sir, I cannot answer for a certainty.

Mr. HARRIS. I have always wondered why it is necessary. I have them on my car and most all cars have them. It is what the manufacturers put on. As a matter of fact, I have a 1959 Buick automobile that has three cigarette lighters in it. I did not ask for them. Why are they on there? What is the purpose? I had to pay for all three of them—it was standard equipment on the car.

Mr. MOORE. I think that the General Services Administration would certainly agree, sir, that many of these items such as the three cigarette lighters could be replaced by some safety devices that we ought to be happy about having.

I find that my car has, I think, two or three cigarette lighters, and I have no occasion to use them.

Mr. HARRIS. These standards are not statutory. That is what I am trying to get at. You say that you have a statutory limitation on the amount you can pay, but you do not have statutory standards for equipment.

Mr. FLATLEY. That is correct, Mr. Chairman.

Mr. MOORE. We could, within the money available, change the specifications to obtain some new device other than the one that is down there.

Mr. HARRIS. Supposing that the State Department would say to you, "We do not want our cars with dual horns." Could you override them and say, "You have to have them"?

Mr. MOORE. We probably would not.

Mr. FLATLEY. The manufacturer would charge us additional money if we changed any of the present standards, Mr. Chairman. Every agency of Government has its own likes and dislikes, of course, but within the standards that are presently established, each agency of Government must accept those. They can appeal, and if they have good and substantial reasons, we will grant individual exceptions on

individual procurements, but they are intended to be standards that work across the board and have, in effect, compulsory compliance.

Mr. HARRIS. In other words, then, if you were to decide to require as standard equipment safety items that would be provided in this bill, then you could require that and negotiate with the manufacturers accordingly? Is that not correct?

Mr. FLATLEY. That is exactly correct.

Mr. MOORE. Did you say it would cost additional money?

Mr. FLATLEY. It will.

Mr. HARRIS. Is it possible that you could leave off some things and ask for other things?

Mr. FLATLEY. That is correct.

Mr. HARRIS. Would that not be within the ceiling?

Mr. FLATLEY. That is within the Appropriations Committee's jurisdiction.

Mr. HARRIS. They are not a legislative committee.

Mr. FLATLEY. They have always had this particular rider in the Independent Offices bill.

Mr. HARRIS. I imagine that the limitation was for the use of the funds.

Mr. FLATLEY. It is specific. Previously it appeared in the Treasury-Post Office when Federal Services was a constituent part of the Treasury Department. It has been a rider to the authority since the Treasury Procurement Division, back some 20-odd years ago, carried over into General Services Administration its appropriation authority and is applicable to all appropriations of the Government, even including the military.

Mr. HARRIS. Do you use the Bureau of Standards?

Mr. FLATLEY. Yes, sir. We use every facility of Government, including Ordnance Tank Research.

Mr. HARRIS. The Bureau of Standards is available to any other Federal agency.

Mr. FLATLEY. Yes, sir. We were delighted to hear Secretary Ribicoff stress this particular part of that. We work, very, very co-operatively with all of the activities, including the Department of Health, Education, and Welfare.

Mr. HARRIS. Thank you, Mr. Roberts.

Mr. ROBERTS. Thank you, Mr. Harris.

Mr. SCHENCK. I have no more questions.

Mr. ROBERTS. Mr. Rogers?

Mr. ROGERS of Florida. I have a question of two. Who is actually involved in deciding what standards will be set, so far as the General Services Administration is concerned? What group within your agency decides this?

Mr. FLATLEY. The Standardization Division.

Mr. ROGERS of Florida. How many people are involved in that?

Mr. FLATLEY. We have 118 people in that particular Division.

Mr. ROGERS of Florida. And what is their competency on this? Are they engineers?

Mr. FLATLEY. Yes, sir. They are all engineers. They work co-operatively with every agency of Government, both big business and little business—all of the trade associations, and all of the standards associations.

Mr. ROGERS of Florida. If you have no research program, although you have the benefit, you say, of the American Standards Association, the Society for Automotive Engineers, and these various other organizations that you list, including the Bureau of Standards, who makes the decision as to which recommendation will be accepted?

Mr. FLATLEY. We resolve it in committee conference. We have a membership made of technicians from all parts of Government. We resolve this and recommend to Mr. Moore the promulgation of the specific standards. It becomes mandatory when it is promulgated by Mr. Moore for the Federal establishment.

Mr. ROBERTS. How long have you had this authority?

Mr. FLATLEY. This authority is in Public Law 152, under which the General Services Administration was created. What we call 152 of the 81st Congress.

Mr. ROBERTS. Of the 81st Congress?

Mr. FLATLEY. Yes, sir. That has been for 10 years.

Mr. ROBERTS. Ten years ago?

Mr. FLATLEY. Yes, sir.

Mr. ROBERTS. You have, so far as I can tell, from the testimony, never made any recommendations of a safety-type lock to be installed on Government cars, have you?

Mr. FLATLEY. No, sir; we have not.

Mr. ROBERTS. Nor have you advocated the elimination of projections on the cars, have you?

Mr. FLATLEY. No, sir.

Mr. ROBERTS. Nor have you asked for the elimination of other interior design features or such matters as sharp-pointed bumpers?

Mr. FLATLEY. No, sir. We have not, although we have watched with a great deal of interest, both the experiments in the Department of Health, Education, and Welfare as well as the AAA's and the recommendations of the American Medical Association. We are interested by standards, if I may put it that way, to resolve the recommendations of the parties at interest.

Mr. ROGERS of Florida. Would it be easier for you to let an agency which has research facilities set the standards which you would apply in purchasing?

Mr. FLATLEY. If I may put it this way, we would prefer to have them do the research and then come to us with the recommendations that we could resolve with all of the interested parties in the Federal establishment, including this committee.

Mr. ROGERS of Florida. You discussed the changeover to the General Services Administration and that concerned me. When we look at the Department of Health, Education, and Welfare, we find that they do some research. When we look at the Department of Commerce we find that they do some research. Yet here is the General Services Administration that has no research, and they do the purchasing.

Mr. FLATLEY. The reason for that, Mr. Rogers, is that General Services Administration buys all of the passenger cars for all of the executive agencies.

In addition to that, we establish the purchase standards. And we think that we can be much more effective with our organic authority in this area to produce the results that the committee is interested in.

Mr. ROGERS of Florida. That is one of the things which concerns me.

I wonder in my own mind whether it is advisable to have the people who do research, and coordinate research, unable to decide on its use.

That is the point I want to raise. Why should another group have to come in and go over the whole thing and decide whether it should be used or not?

Mr. FLATLEY. I think that we are in almost the same parallel case as Governor Ribicoff pointed out in your informational area. You have got to marry a lot of people and a lot of ideas.

The research people have to be aware of the practicalities of taking a recommendation based purely on research as related to both production and use. For example, the research people may or may not have contacts with safety people. They may not have contacts with people engaged in driver training.

We hit every segment of this in our coordination of the entire problem. That is the reason we have recommended this to the committee.

Mr. ROGERS of Florida. You have experts in each of these fields?

Mr. FLATLEY. Yes.

Mr. ROGERS of Florida. Who are working in this division that coordinates everything?

Mr. FLATLEY. That is correct.

Mr. ROGERS of Florida. And they are on your own staff?

Mr. FLATLEY. That is right.

Mr. ROGERS of Florida. Thank you.

Mr. ROBERTS. Thank you again. I have just one short question and I will be through with my examination.

In the fourth paragraph of the letter sent to this committee by the Administrator, dated April 14, 1961, it is stated:

In determining safety devices which should be added to the procurement standards, the General Services Administration will seek the recommendations of the Interdepartmental Highway Safety Board, established by Executive Order 10898, dated December 2, 1960, and which, it is understood, is now becoming operative.

Would you think that by waiting to receive the recommendations from this Board, which is really just getting started, that it would not serve to delay in getting safety devices on Government automobiles?

Mr. MOORE. I am not too familiar with the Interdepartmental Board. I will ask Mr. Farris to answer.

Mr. ROBERTS. I will tell you that the Chair has the same trouble. I have not really found out much about it.

Mr. FARRIS. I do not believe that it will delay, but as the Interdepartmental Highway Safety Board becomes operative I think it can render an assistance to General Services Administration in helping to determine which safety items should be added to the specifications and standards, sir.

Mr. ROBERTS. Do you know where the personnel of the Board will be obtained. Is it an advisory group?

Mr. FARRIS. It is an advisory group, sir. The personnel will come from the member agencies.

Mr. ROBERTS. Will there be members from the general public on this Board?

Mr. FARRIS. Not on this Board. They are members on the general board—on the President's Committee for Traffic Safety, which is a consultant to this Board.

Mr. MOORE. The Secretary of Commerce is on this Board, so it is handled through the Bureau of Standards.

Mr. ROBERTS. In Government circles, does Commerce have the only membership on this?

Mr. FARRIS. The Board is composed only of Government agencies. The Secretary of Commerce is designated as the Chairman of the Board. Membership on the Board includes both the Secretary of Health, Education, and Welfare, the Postmaster General, the Administrator of General Services Administration, the head of the Interstate Commerce Commission, and some others.

Mr. ROBERTS. So, it is in all respects at that level?

Mr. FARRIS. The agency head level.

Mr. ROBERTS. Do you know if there are any research activities that will be carried on by the Board, will it be limited pretty well to policy-making?

Mr. FARRIS. I do not believe that the Board would carry on any research activities as such, but I think the Board could properly recommend that certain items be the subject of research and testing by the Bureau of Standards, or by any of the Federal agencies which have research facilities, or could recommend that certain research activities be instituted under contract.

Mr. ROBERTS. Do you agree that it is rather difficult to know what the action of the Board will be at this point?

Mr. FARRIS. Yes, sir.

Mr. SCHENCK. If you will permit me to make an observation there?

Mr. ROBERTS. Yes.

Mr. SCHENCK. I do not imagine that the Secretary of Commerce, the Secretary of Health, Education, and Welfare, personally sit on this Board. They no doubt delegate that to somebody. And the Board, probably, means very little.

Mr. ROBERTS. Thank you.

Mr. ROGERS of Florida. I hope that you would not hold up any of your consideration waiting on the formation of that particular Board. It seems to me that there are enough agencies to give your information on safety features which could be acted upon now, since this Board will not conduct research itself. It will act in the capacity that you are now acting.

Mr. ROBERTS. Thank you and the gentlemen who have accompanied you here to the hearing.

Mr. MOORE. I thank you.

Mr. ROBERTS. Mr. Whitton is our next witness. Would it be convenient for you to come tomorrow?

Mr. WHITTON. Mr. Chairman, I have to go before the Appropriations Committee tomorrow at 10 o'clock.

Mr. ROBERTS. We could possibly get to you this afternoon if we get permission to sit. How long do you think you will be with the Appropriations Committee tomorrow?

Mr. WHITTON. It is rather difficult for me to say, Mr. Roberts. I expect that it will be for an hour or an hour and a half.

Mr. ROBERTS. If I can get permission to sit this afternoon, I will convey that information to the clerk of the committee, Mr. Williamson, and if you will keep in touch with him, we will meet at 2 o'clock.

Mr. WHITTON. Thank you.

Mr. ROBERTS. We will recess at this time to reconvene at 2 o'clock this afternoon.

(Whereupon, at 12:10 p.m. the subcommittee recessed to reconvene at 2 p.m. the same day.)

AFTERNOON SESSION

Mr. ROBERTS. We will come to order.

This afternoon our witness is Mr. Rex M. Whitton, Federal Highway Administrator, Bureau of Public Roads, U.S. Department of Commerce. Will you identify the gentlemen.

Mr. WHITTON. On my right is Mr. E. H. Holmes, Assistant Commissioner for Research; and on my left is Mr. Charles Prisk, Special Assistant on Highway Safety.

Mr. ROBERTS. We are certainly glad to have you, gentlemen. Mr. Whitton, you may proceed.

STATEMENT OF REX M. WHITTON, FEDERAL HIGHWAY ADMINISTRATOR, BUREAU OF PUBLIC ROADS, U.S. DEPARTMENT OF COMMERCE; ACCOMPANIED BY E. H. HOLMES, ASSISTANT COMMISSIONER FOR RESEARCH, AND CHARLES PRISK, SPECIAL ASSISTANT ON HIGHWAY SAFETY

Mr. WHITTON. Mr. Chairman, I am happy to have this opportunity to be with you. I, like some of the others that have testified, am rather new here, having come to Washington in this position the 19th of January, but I do not think of myself as new in the field of highway safety.

For 10 years prior to my coming here I was chief engineer of the Missouri Highway Department, and for 15 years prior to that I was engineer of maintenance for the Missouri Highway Department. And in both of those positions I was vitally interested in highway safety.

We claim credit in Missouri for having initiated the safe driving speed you find posted on curves: those signs that tell you what the safe speed is for the particular curve.

I, also, was a member of the first committee that tried to standardize no-passing zones. You may recall that we used to have all kinds of different types of markings for no-passing zones.

So we have followed highway safety in the use of no-passing lines and pavement edge lines and many types of signing and many improvements of traffic control devices through the years, including reflectorizing of signs and pavement lines. We are deeply interested in highway safety and have been for 25 or more years.

So, again, I am happy to have the opportunity of speaking to you today and that you and your committee are taking such a deep interest in highway safety.

Mr. ROBERTS. May I say that we are delighted to have someone with the background and experience that you have; and certainly in the items that you mentioned which have made a contribution to the subject of highway safety.

Mr. WHITTON. We have been asked to set forth in some detail the responsibilities and functions of the Bureau of Public Roads, U.S. Department of Commerce, in the field of highway safety.

I have a prepared statement covering these matters. It also attempts to define the working relationship that the Bureau has with others engaged in this field, both governmental and private, and to evaluate the real effects of these efforts to achieve highway safety.

The primary task of the Bureau of Public Roads is, and has been for more than four decades, to develop an adequate highway transportation system for the Nation, working cooperatively with the States. Highways are built to serve their users and the total welfare—for no other reason. The service to users and to the total welfare is adequate only when highway transportation is both efficient and safe.

Because traffic accidents are prominent among the inadequacies in highway transportation, the Bureau of Public Roads is sensitive to its specific and implied responsibilities in highway safety.

The Office of Road Inquiry, created by an act of Congress dated March 3, 1893, was the forerunner of the Bureau of Public Roads, and a look at that early legislation shows that that agency was created largely to make inquiries and investigations of the systems of road management and roadbuilding and to assist college and experiment stations in disseminating this information.

From this beginning, highway research, testing and investigative responsibilities have grown to the scale envisioned by the current statutory authority which reads:

The Secretary is authorized in his discretion to engage in research on all phases of highway construction, modernization, development, design, maintenance, safety, financing, and traffic conditions * * *.

From this it will be evident that research into highway safety is a specific obligation of the Department and the Bureau of Public Roads. Because the national roadbuilding program is a huge administrative and physical task, and is itself immediately related to the safety of highway travel, the research program of the Bureau of Public Roads in safety has been largely highway oriented.

For this reason, some fail to realize that Public Roads has been active on research projects of immediate concern to safety for more than a generation. An abbreviated review of some of the typical safety researches conducted during this period was presented to the 1958 Williamsburg Conference on Highway Safety Research, which attracted distinguished scientists from many disciplines, and can be made available with this statement, if desired.

These researches have not been approached solely from the highway engineering viewpoint, but they have been aimed at the solution of those difficult, practical problems of a dynamic operating system that must be understood if we are to improve traffic safety.

Research in the Bureau of Public Roads today is more attentive than ever to safety needs. Most projects are performed in the realistic environment of the vehicle-driver-highway situation, and incorporate knowledge and techniques from disciplines other than engineering wherever this is appropriate. Study of traffic accident data alone is not altogether satisfactory as a basis for improving highway safety because traffic accidents are a rare rather than a common occurrence.

This is shown by experience. There are 20 million miles of driving for every traffic fatality, or some 2,000 years of driving for the average motorist. For this reason, the Bureau of Public Roads has been engaged continuously in study of driver habits and behavior since the mid-1930's, as well as of accident circumstances themselves.

The literature of scientific journals in the highway field is generously marked with the evidence of these contributions to safer highway design and operating practices, all of them keyed to the capabilities and characteristics of persons and vehicles that use the highway.

It will not hurt to repeat that controlled access highways of modern design have only one-third the fatalities and one-half the accidents of highways of the type being built a few years ago. That means that this control of the right of people to come onto the highway has dramatically cut accidents. That one feature, and the other key feature of the divided lane pavement makes a greater contribution to highway safety in the saving of lives and accidents than any other two features, in my judgment. These features are something we must never give up by pressure or otherwise from our highway standards.

Accident cost research being conducted cooperatively with the States will provide a more valid basis than ever before for measuring the effectiveness of the many approaches to traffic safety.

Much has been said of the highway safety research function in the Bureau of Public Roads because research is the most effective way to achieve still greater safety progress with minimum cost and resistance from the public and officials alike. This year's research program includes highway safety projects and projects with strong overtones of safety that are being conducted or supported by Public Roads. While the Bureau is spending \$456,000 of administrative funds on such projects, it is providing technical guidance and coordination through its cooperative approach to research efforts with a projected cost totaling \$2.5 million.

It is logical that the Federal Government support a broad, coordinated program of highway safety research. An inventory of the Federal effort reported to the Congress in 1959 by the Secretary of Commerce in "The Federal Role in Highway Safety" indicated that safety research was limited indeed, when compared with the traffic needs. It was stated then that even a slight reduction in total traffic accident losses would justify a substantial research expenditure.

The future of highway safety research depends not only upon the men of talent, skill, and knowledge working in Public Roads or elsewhere in the Federal Government, but upon those with official responsibility at all levels of Government, upon researchers at universities, and others in private organizations.

The Bureau of Public Roads program is tailored to this desirable pattern of cooperation. Excellent relations have been built with other researchers, with public officials having traffic safety responsibility, with the highly important auto industry, and with the many representatives of the public who are able and ready to back an accelerated safety research program, and to implement its findings.

Moving to another area, the Bureau of Public Roads has been the principal Federal agency participant in the several Presidential conferences on highway safety.

I attended that first meeting in 1946, and since that year, Public Roads has been staffing the general headquarters operation and administering those funds (now \$150,000 annually) specifically designated for advancing the President's action program in traffic safety. The President's Committee for Traffic Safety has no Federal officials

among its membership, but its working body, the Advisory Council, has two top officials of Public Roads on its roster.

Other Public Roads personnel participate actively in key positions on technical committees to improve the effectiveness of the President's Committee's work in conferences for legislators, educators, research scientists, and laymen, to update technical recommendations of the action program, and to plan with others the long-range objectives and programs of the Committee.

From the funds available for support of the President's action program, the Bureau of Public Roads established and supports a traffic safety research correlation service at the National Safety Council, contributed to a series of training conferences for traffic court judges arranged by the American Bar Association, assisted the American Association of Motor Vehicle Administrators in their program to encourage more widespread adoption of uniform traffic laws among the States, and sponsored research at Northwestern University Traffic Institute to determine desirable practices in traffic law enforcement.

Pursuant to Public Law 86-660, the Bureau of Public Roads has just organized a Driver Register Service which will permit State motor vehicle authorities to check with a central file and avoid the inadvertent licensing of any applicant for an operator's permit when that individual's privilege to drive has been withdrawn or revoked because of driving while intoxicated or involvement in a fatal accident.

This new program has been favorably received already by nearly half the States. Public Roads anticipates that, in addition to its primary objective, the Driver Register Service program may also be an influence for more uniform driver license administration, which itself would be a powerful force for safety.

Bureau of Public Roads personnel are continually in demand for participation in safety activities of national associations and organizations. To the extent that the workload permits effective service to undertakings of major significance to safety, these opportunities are accepted.

Illustrative of these is a top official of Public Roads who serves as Vice President for Traffic in the federally chartered National Safety Council, and another who serves as a member of the Executive Committee of the Council's Traffic Conference, the principal policymaking body on traffic safety.

In another instance, a Public Roads official is chairman of the National Joint Committee on Uniform Traffic Control Devices, a safety standards group representing all government levels and interests concerned with uniform and effective traffic signs, signals, markings, and similar safety devices.

In cooperation with representatives of the automotive industry, State motor vehicle administrators, traffic engineers, and others competent in the scientific community, including human factors specialists, Public Roads has also been studying means for improving intervehicular communications systems and equipment so that drivers may at all times have the benefit of information pertinent to safe performance of their task.

As an example of its cooperative work with other Federal agencies, a Public Roads representative is a member of the Accident Prevention Research Study Section and participates in the review and action on

applications made to the Public Health Service for research grants in traffic safety.

In another case, a Public Roads authority on truck brake performance serves as chairman of a brake advisory committee to the Interstate Commerce Commission on their safety regulations applicable to brake equipment. Recently a major national conference was held to consider the value of driving simulation equipment as a tool for future highway safety research. This was jointly sponsored by Public Roads, the Public Health Service, and the Automotive Safety Foundation.

Resulting from this is a group now being created in the Highway Research Board of the National Research Council for pursuit and best realization of any potentials for safety through that means. This liaison activity is important in avoiding wasteful duplication of Federal research effort in highway safety.

Mr. Chairman, here are the proceedings of that National Conference on Driving Simulation. I would like to leave it with you.

Mr. ROBERTS. Thank you.

Mr. WHITTON. As a part of the record, if you want to so make it.

In the international field, a Public Roads official headed the U.S. delegation to the First International Conference on Scientific Research into Road Safety held in July 1960. Another is program chairman for the international sessions at the World Traffic Engineering Conference scheduled in Washington during August 1961. Important gains in technical knowledge of highway safety developed from research and experience in other countries will help to accelerate improvements in the United States particularly through refinement of engineering and other standards contributory to highway safety.

I have gone into these matters in considerable detail in the hope that a rather full explanation would be responsive to the subcommittee's wishes.

I am also filing separately a list of current research projects in safety, classified in four groups, and a brief bibliography of recent safety articles and publications resulting from direct or cooperative research of the Bureau of Public Roads.

Mr. ROBERTS. That will be made a part of the record.

(Appendix A follows:)

APPENDIX A

GROUP 1. AUTOMOBILE HIGHWAY SAFETY INVESTIGATION BEING CONDUCTED BY THE OFFICE OF RESEARCH, BUREAU OF PUBLIC ROADS

1. *Vehicle emergency braking systems.*—Laboratory, field, and service tests of emergency braking systems for combinations of commercial vehicles to determine the effectiveness of systems required by the ICC motor carrier safety regulations in preventing runaway vehicles and to evaluate the effectiveness and practicability of emergency braking systems other than those contemplated under the motor carrier safety regulations.

2. *Winter driving hazards.*—Vehicle performance measures to improve operation under winter driving conditions with respect to traction, braking, and maneuverability.

3. *Driver and vehicle characteristics study.*—A study of various vehicle characteristics such as model, year, horsepower, and various driver characteristics such as speed, age, etc., as related to accident experience and travel.

4. *Effect of small-car operation on traffic safety flow and capacity.*—A study to determine the effect of very small and of medium-sized cars on highway safety and traffic flow characteristics.

5. *Improved communication between drivers, vehicle to driver, and highway to driver.*—To determine what information the driver obtains from his driving environment, how he treats this information, reaches decisions and acts, and to consider methods for improving the total communication process.

6. *Survey on intervehicle communication.*—A thorough survey of the communication needs of drivers by direct interview in questionnaire to develop priority of communication needs and to develop criteria for measuring and testing the effectiveness of communication.

7. *Effect of speed communication on intervehicle spacing.*—A study of feasibility of modifying the safe headways between vehicles through the improved communication between vehicles by visual means such as improved vehicle taillights and signals.

8. *Road loading mechanics.*—A study concerned with the physical effects of motor vehicle operation and design, especially with respect to suspension systems, upon vehicle life, vehicle handling capabilities, driver fatigue, road life, and the interaction of the elements involved in road design.

GROUP 2. OTHER SAFETY RESEARCH STUDIES

1. *Evaluation of traffic safety betterments associated with traffic control devices and measures, and with more intensive application of accepted uniform standards for highway design.*—To determine the safety value of various traffic control devices, measures, and traffic design elements, giving particular attention to the effects of uniformity and standardization.

2. *Accident experience related to control of access.*—To determine the effects of accident control on various types of accidents as related to certain design features of the highway.

3. *Accident experience related to traffic control devices.*—To determine accident rates for various types of traffic control devices to develop standards for the use of and improvement of traffic control devices.

4. *Interstate System accident research.*—Accidents and relative traffic on the Interstate System will be related to various design features and to select traffic characteristics in order to refine design standards and to improve traffic operations on the Interstate System.

5. *Speed regulation.*—To determine and evaluate the factors involved in regulating the speed of vehicles on the highway and to establish procedures for speed zoning and for obtaining maximum compliance with speed regulations.

6. *Economic costs of motor vehicle accidents.*—To evaluate in detail the direct annual cost of motor vehicle accidents to vehicle owners and the indirect annual cost of motor vehicle accidents to all citizens.

GROUP 3. PROJECTS THAT ARE NOT OF A RESEARCH NATURE BUT WHICH RELATE DIRECTLY TO HIGHWAY SAFETY

1. *Highway safety and uniform laws.*—A cooperative agreement with the American Association of Motor Vehicle Administrators to provide an active program to encourage and assist in the adoption of more uniform and effective State laws and regulations relating to motor vehicles and highway traffic.

2. *Traffic court program.*—A program of training activities to upgrade the work of the traffic courts.

3. *Traffic safety clearinghouse.*—The development of factual data concerning all recent current and proposed researches on traffic safety.

4. *Safety promotion as related to the uniform vehicle code.*—To advance the cause of safety on streets and highways and to encourage and assist in the adoption of more uniform and effective State laws and regulations relating to motor vehicles and their operation.

GROUP 4. STUDIES RELATED TO HIGHWAY SAFETY BUT WHICH HAVE AS THEIR MAIN OBJECTIVE THE IMPROVEMENT OF HIGHWAY DESIGN, AND TRAFFIC CONTROL AND OPERATION

- (1) Driver performance on surfaces of various width.
- (2) Hill climbing ability and acceleration ability of motor trucks.
- (3) Effect of width and type of shoulder on traffic safety and movement.
- (4) Effect of median dividers on traffic operations.
- (5) Driver behavior and safety of operation as related to highway lighting.
- (6) Television traffic surveillance on heavily traveled urban facilities.
- (7) Variables affecting traffic flow and capacity at intersections.

- (8) Simulation techniques for the timing of progressive traffic light systems in vehicular traffic control.
- (9) Rural and urban freeway capacities.
- (10) Weaving area operating characteristics and capacities.
- (11) Access and exit ramps.
- (12) Rural highway capacities as related to geometric design.
- (13) Increasing traffic-carrying capabilities of urban arterials.
- (14) Revision of manual on uniform traffic control devices.
- (15) Trends in operating speeds on main rural highways.

In addition to the report entitled, "The Federal Role in Highway Safety" (H. Doc. No. 93, 86th Cong., 1st sess.) which contains references to research completed by the Bureau of Public Roads prior to 1958, the following is a list of articles published since then. These references are the result of research conducted directly or in cooperation with the Bureau of Public Roads.

- (1) "Traffic Signals and Accidents in Michigan," by David Solomon, Public Roads, volume 30, No. 10, October 1959.
- (2) "Two Simple Techniques for Determining the Significance of Accident-Reducing Measures," by Richard M. Michaels, Public Roads, volume 30, No. 10, October 1959.
- (3) "The Economic Cost of Traffic Accidents in Relation to the Human Element," by Robie Dunman, Public Roads, volume 31, No. 2, June 1960.
- (4) "The Economic Cost of Traffic Accidents in Relation to the Highway Systems," by Bernard B. Twembly, Public Roads, volume 31, No. 2, June 1960.
- (5) "The Economic Cost of Traffic Accidents in Relation to the Vehicle," by James F. McCarthy, Public Roads, volume 31, No. 2, June 1960.
- (6) "The Economic Cost of Traffic Accidents in Relation to Highway Planning and a Comparison of Accident Costs in Utah and Massachusetts," by J. E. Johnston, Public Roads, volume 31, No. 2, June 1960.
- (7) "Driver Tension Responses Generated on Urban Streets," by R. M. Michaels, Public Roads, volume 31, No. 3, August 1960.
- (8) "Traffic Operations as Related to Highway Illumination and Delineation," by A. Taragin and B. T. Rudy, Public Roads, volume 31, No. 3, August 1960.
- (9) "Digital Recording for Highway Research," by R. C. Hopkins, Public Roads, volume 31, No. 3, August 1960.
- (10) "Shoulder Occupancy on Rural Highways," by C. R. Billion, proceedings 38th annual meeting, January 1959.
- (11) "Statistical Determination of Effect of Paved Shoulder Width on Traffic Accident Frequency," by R. C. Blensly, Highway Research Board Bulletin 240.
- (12) "Accidents and the Human Element in Skidding" (First International Skid Prevention Conference, 1959), Highway Research Board Bulletin 219, 5-8, 1959.
- (13) "Community Study of the Characteristics of Drivers and Driver Behavior Related to Accident Experience," by C. E. Billion, Highway Research Board Bulletin 172, 36-94, 1958.
- (14) "Economic Costs of Motor Vehicle Accidents," by Robie Durman, Highway Research Board Bulletin 208, 16-28, 1959.
- (15) "Traffic Behavior and On-Ramp Design," by Ichiro Fukutome and Karl Mockowitz, Highway Research Board, Bulletin 235, 38-72, 1960.
- (16) "Effect of Freeway Medians on Traffic Behavior," by Charles Pinnell, Highway Research Board Bulletin 235, 1-18, 1960.
- (17) "Effect of Edge Striping on Traffic Operations," by I. L. Thomas, Jr., and W. T. Taylor, Jr., Highway Research Board Bulletin 244, 11-15, 1960.
- (18) "A Friction Concept of Traffic Flow," by Adolph D. May, Jr., Highway Research Board Proceedings, 38th Annual Meeting, 1959, 493-510.
- (19) "Effectiveness of Symbols for Lane Control Signals," by T. W. Forbes, Edward Gervais and Terrence W. Allen, Highway Research Board Bulletin 244, 16-29, 1960.
- (20) "Driver Eye Height and Vehicle Performance in Relation to Great Sight Distance and Length of No-Passing Zones; Driver Passing Practices," by O. K. Normann, Highway Research Board Bulletin 195, 1-14, 1958.
- (21) "Comprehensive Analysis of Motor Vehicle License Plates," by Delbert F. Karmeier, C. Gordon Herington, and John E. Baerwald, presented at 39th Annual Meeting of the Highway Research Board, January 1960.
- (22) "Application of Digital Simulation Techniques to Freeway on-Ramp Traffic Operations," by Philip A. Perchonok and Sheldon L. Levy, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(23) "Effect of Pavement Edge Markings on Accidents on Two-Lane Rural State Highways in Ohio," by James V. Musick, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(24) "Effect of Pavement Edge Markings on Operator Behavior," by Robert M. Williston, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(25) "Shoulders and Accident Experience on Two-Lane Rural Highways: A Summary," by R. C. Blensly and J. A. Head, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(26) "Sample Size Requirements for Vehicular Speed Studies," by J. C. Oppenlander, W. F. Bunte and P. L. Kadakia, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(27) "Variability of Fixed-Point Speed Measurements," by Robert P. Shumate and Richard F. Crowther, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(28) "California Median Study—1958," by Karl Moxkowitz and W. E. Schaefer, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(29) "Cross-Median Accident Experience on the New Jersey Turnpike," by John R. Crosby, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(30) "Dynamics Full-Scale Tests of Median Barriers" (Motion Picture), by John L. Beaton and Robert N. Field, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(31) "Increasing the Traffic-Carrying Capability of Urban Arterial Streets," by A. A. Cartar and Jack Berman, presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(32) "Application of Police Power and Planning Controls to Increase the Effectiveness of a Traffic Arterial," by William H. Stanhagen and John J. Mullins, Jr., presented at 39th Annual Meeting of the Highway Research Board, January 1960.

(33) "Highway Safety—A Primary Challenge to Traffic Engineering," by C. W. Prisk, Traffic Engineering, November 1959.

(34) "A Traffic Tale of Two Cities, Science and Technology," U.S. Department of Commerce, March 31, 1959.

(35) "The Motor Vehicle Aspect of Traffic Safety," by C. W. Prisk, SAE summer meeting, June 10, 1960.

(36) "Today's Research—Tomorrow's Practice," by E. H. Holmes, North Carolina State Conference, Raleigh, February 4, 1960.

(37) "Safety Features on Modern Highways," by E. L. Armstrong, 48th National Safety Congress, Chicago, October 20, 1959.

(38) "Human Factors in Highway Safety," by R. M. Michaels, New York State Teachers' Association, October 16, 1959.

(39) "The Speed Factor in Highway Accidents," by C. W. Prisk, Traffic Engineering, August 1959.

(40) "Sign Standards for the Interstate Highway System," by W. G. Elliot, Traffic Engineering, May 1959.

(41) "Dictionary of Highway Traffic," by J. S. Baker, and W. R. Stebbins, Northwestern University, Evanston, Ill., 1960.

Mr. WHITTON. Here is another report I wanted to leave with you, Mr. Chairman. It is entitled "Case Studies of Traffic Accidents." It was prepared by the Traffic Institute of Northwestern University of Evanston, Ill., as the result of intensive research into accident causes. It was sponsored by the same group that sponsored the driver simulation conference, the Automotive Safety Foundation, Bureau of Public Roads, and U.S. Public Health Service. I will leave both of those with you.

I would like to say again I do not think that you realize the great service that your committee is giving the people of this country. As the Secretary of Health, Education, and Welfare said this morning, the world is interested in your studies of highway safety. I have no way of measuring what your contribution will be.

I do know this. We estimate that when we have completed our Interstate System of Highways to the standards that have been determined, and I hope that we get that in 1972, the resulting saving in lives will be a minimum of 4,000 a year—4,000 lives just on that one system of highways.

So, again, I say that such progress is very satisfying to me because I have spent 25 years or more in this work of highway safety. I am very pleased that your committee is taking such a vital interest in this very important subject.

Mr. ROBERTS. Thank you, Mr. Whitton. The Chair appreciates, certainly, the statement that you made. And we are, of course, pleased to have it.

There is one question that I wanted to get to before going into the matters in your statement because I am not too sure that you are prepared to answer this completely. But you may supply the information for the record if you so desire. And I refer to the United States Code, 1958 edition, section 307, titles 22-26, entitled "Research and Planning." I am reading part of that; I would like for the whole section to go into the record:

The Secretary is authorized in his discretion to engage in research on all phases of highway construction, modernization, development, design, maintenance, safety, financing, and traffic conditions, including the effect thereon of State laws, and is authorized to test, develop, or assist in the testing and developing of any material, invention, patented article, or process.

I will not read the rest of it because it provides for the delegation of authority, and so on.

Mr. Reporter, you will have the entire section put into the record. (The section follows:)

307. United States Code 1958 edition:

RESEARCH AND PLANNING

A. The Secretary is authorized in his discretion to engage in research on all phases of highway construction, modernization, development, design, maintenance, safety, financing, and traffic conditions, including the effect thereon of State laws and is authorized to test, develop, or assist in the testing and developing of any material, invention, patented article, or process. The Secretary may publish the results of such research. The Secretary may carry out the authority granted hereby, either independently or in cooperation with any other branch of the Government, State agency, authority, association, institution, corporation (profit or nonprofit), or any other organization, or person. The funds required to carry out the provisions of this subsection shall be taken out of the administrative and research funds authorized by section 104 of this title and such funds as may be deposited in a special account with the Secretary of the Treasury for such purposes by any cooperating organization or person. The provisions of section 3709 of the Revised Statutes, as amended (41 U.S.C. 5) shall not be applicable to contracts or agreements made under the authority of this subsection.

B. The Secretary shall include in the highway research program herein authorized studies of economic highway geometrics, structures, and desirable weight and size standards for vehicles using the public highways, and of the feasibility of uniformity in State regulations with respect to such standards, and he shall report from time to time to the Committees on public works of the Senate and of the House of Representatives on the progress and findings with respect to such studies.

C. Not to exceed 1.5 per centum of the sums apportioned for any year to any State under section 104 of this title shall be available for expenditure upon request of the State highway department with the approval of the Secretary, with or without State funds, for engineering and economic surveys and in-

vestigations, for the planning of future highway programs and the financing thereof, for studies of the economy, safety, and convenience of highway usage and the desirable regulation and equitable taxation thereof, and for research necessary in connection with the planning, design, construction, and maintenance of highways and highway systems, and the regulation and taxation of their use (Public Law 58-767, Aug. 27, 1958, 72 Stat.).

Mr. ROBERTS. What I wanted to ask you was this. I believe that the amount under the legislation authorized under section 104 of the title amounted to about 1 percent.

Mr. WHITTEN. $1\frac{1}{2}$ percent under section 307(c).

Mr. ROBERTS. $1\frac{1}{2}$?

Mr. ROBERTS. Of the funds under the Highway Act of 1956.

Mr. HOLMES. We get about 1 percent for our total administration at the Bureau, and the actual percentage for research is a good deal less than that.

Mr. ROBERTS. I wanted to get the facts. If 1 percent of the huge fund is devoted to research; and if you have that much money, we ought to be making more progress. I would like for you to clarify that for the record.

Mr. HOLMES. For 1961 the Office of Research budget for the Bureau of Public Roads amounts to \$3,727,000. That provides for quite a lot of services, in addition to research. That compares with total Federal highway authorizations for 1961, which would be somewhere over \$3 billion. So it would be considerably less than 1 percent. It would be about one-tenth of 1 percent that is available for research. I can give you the figures.

Mr. ROBERTS. Will you furnish the breakdown?

Mr. HOLMES. Yes.

Mr. ROBERTS. And give me an explanation of where those funds are being used?

Mr. WHITTON. We will be glad to give it to you.

(The information follows.)

HON. OREN HARRIS,
Chairman, Committee on Interstate and Foreign Commerce,
House of Representatives,
Washington, D.C.

DEAR MR. CHAIRMAN: During our April 17 testimony on the Bureau of Public Roads highway safety program, Chairman Roberts of the Subcommittee on Health and Safety asked for more precise information on safety financing in relation to the national highway program. We are glad to provide this for the subcommittee.

Sections 104 and 307 of title 23, United States Code, govern the administrative, research, and planning expenditures for highway purposes. Section 104(a) directs the Secretary to deduct an amount not to exceed 3½ percent of all the sums authorized to be appropriated, as necessary for administering provisions of the highway law, and also for carrying on the research authorized by sections 307(a) and 307(b). Total Federal aid authorizations available for obligation during 1961 are \$3,075,674,000. The administrative, research, and planning funds authorized under section 104 totaled \$28,305,000 or slightly less than 1 percent of the total authorization, and from this comes the budget of the Office of Research, which totals \$3,727,000. Certain nonresearch expenditures are included in this total, and the funds expended for research total \$3,159,932.

It is important to understand that section 307(c), in addition to the Office of Research budget, authorizes a further amount not to exceed 1½ percent of the Federal funds apportioned to the States to be made available for engineering and economic investigations, for planning, and for studies and research; and that these 1½ percent funds, unlike those authorized in sections 307(a) and 307(b), are available for expenditure upon request of the State highway

departments, with the approval of the Secretary of Commerce. For fiscal year 1961, the section 307(c) funds available totaled \$40,466,147.

From the two sources described, sections 104, 307(a) and (b), and from section 307(c), the funds being expended in behalf of safety during 1961 are estimated at \$425,000 and \$575,000, respectively, a total of \$1 million, or three-hundredths of 1 percent of the total Federal aid authorization. Almost all of this can be classed as safety research expenditure, the only important exception being the \$35,000 for operation of the newly established driver register service activity.

The 1½-percent funds authorized in section 307(c) are not only programed for expenditure by the State highway departments with the approval of the Secretary of Commerce, but are customarily matched by State funds in the same ratio as the Federal aid construction funds. This matching is not a legal requirement, but an administrative policy considered to have important merits, and can be and is waived where special circumstances exist. Obviously, one effect of the matching with State funds is to extend the scale and range of the projects undertaken with the 1½-percent funds. It also tends to magnify State interest, technical participation, and responsibility in planning and research work.

In addition to the indicated \$1 million for Federal participation during fiscal 1961 in safety research and other work whose total cost is substantially greater, the Secretary of Commerce administers the \$150,000 authorized in section 313 of said title 23 and in accordance with section 104(a) to assist in carrying out the action program of the President's Committee for Traffic Safety. Within this limitation, financial support is given to the traffic court program of the American Bar Association, and to the continuing work of the National Committee on Uniform Traffic Laws and Ordinances, and the American Association of Motor Vehicle Administrators on the development of uniform laws and model ordinances and encouragement for their enactment in the States and cities. Funds are provided also for a traffic safety research correlation service at the National Safety Council. Our support of these special projects stimulates financial contributions from other sources and thus tends to increase the usefulness to highway safety. Other funds within the \$150,000 limitation are used to staff much of the headquarters operations of the President's Committee for Traffic Safety and for special conferences and meetings periodically scheduled to advance objectives and programs of the committee.

We appreciate the opportunity the subcommittee has offered for submission of this information.

Sincerely yours,

REX M. WHITTON,
Federal Highway Administrator.

Mr. ROBERTS. First of all, I will ask if you are familiar with the comment in the Department's report entitled "The Federal Role in Highway Safety"? This was the report, I believe, authorized under section 117.

Mr. WHITTON. I will have to ask Mr. Holmes to answer that.

Mr. HOLMES. Mr. Prisk is the author. He will be glad to try to answer any questions.

Mr. ROBERTS. Since we have the author here, let us have him answer. He is familiar with it if he wrote it.

Mr. Prisk, on page 3 of the report it reads as follows:

There are residues of weakness in automotive design and function, however, to which manufacturers and public officials alike need to give further attention.

You understand that there are certain safety features which are available and which could and should be included in automobiles as standard equipment. Would that be a fair statement of what you meant by that statement?

Mr. PRISK. As a general observation, I would agree; yes, sir.

Mr. ROBERTS. Further, in the same report, referring to standards set by government, there is this statement:

Many States require certification through their motor vehicle departments that these standards have been met. An expansion of such standards, and a more widespread use of the certification process by the States, would lead to quicker adoption of desirable vehicle safety features.

This question: Do you interpret this to mean that the State should tighten up their safety requirements and require the adoption of safety features by law, if necessary?

Mr. PRISK. The intent of that paragraph, as I understand it, is that there should be more widespread attention on the part of the States to certifying equipment which contributes to safe operation of the vehicle and a broader acceptance of certain design standards which contribute to safety. This would be desirable insofar as the actions in the States are concerned.

Mr. ROBERTS. That should be installed?

Mr. PRISK. This is a statement that applies to all automobiles and not merely to State purchased automobiles.

Mr. ROBERTS. Would you say then that if the States could expand the use of safety devices by the adoption of these standards or by the insistence that they be incorporated in cars purchased by the States, would it follow that the Federal Government have the responsibility for the same type of vehicles used by Government employees?

Mr. PRISK. Yes; I think it would.

Mr. ROBERTS. Do you believe that if this were to be followed, this line of reasoning, that the general public, the consuming public, would, perhaps, look to the Federal Government as an example or as a place where leadership in the promulgation of safety devices would be advanced?

Mr. PRISK. To the extent that the purchase of vehicles for Federal use can be effectively used as an example, it would have a benefit, certainly, among the general public, yes.

Mr. ROBERTS. Do you think it would serve the purpose of giving a more accurate body of statistics as to what these devices would do in the field of saving lives and prevention of injuries all along the line?

Mr. PRISK. This feature I would not be so sure of because of the difficulty with the accident record system, and the control of the information. The experience that would be gained in the use of Federal automobiles would, certainly, make a contribution. And depending on how the public reacted and the way the records were reported and processed, it might serve that purpose, yes.

Mr. ROBERTS. Has the Bureau done any research on the safety features recommended by the American Medical Association and which features were included in this committee's report on H.R. 1341 in 1959?

Mr. PRISK. This includes the speed governors—

Mr. ROBERTS. If you do not have it before you, I will hand you this report and give you a chance to see what we have in mind.

Mr. PRISK. Thank you. I am not aware of any direct participation on the part of Public Roads insofar as the details of vehicle design are concerned, as referred to in this report. We have maintained a sharp interest in these features and have witnessed a great

deal of the crash testing that has been done in the industry and have kept abreast of it. We have not sponsored any research of the type mentioned.

Mr. ROBERTS. Has the major part of the work of Commerce been concentrated in the field of public highways, interstate highways, and other types of roads, rather than on research in the field of safety features, safety devices?

Mr. PRISK. I think Mr. Whitton's statement refers to that and indicates that our research has been largely highway oriented.

Mr. ROBERTS. To get back to Mr. Whitton, I notice in your statement the reference to the work of the Bureau on uniform traffic laws. Our committee is quite interested in that field, because, as you know, I think one of the first resolutions which this committee sponsored was the Beamer resolution which was to promote an interstate compact in the field of uniformity.

Mr. WHITTON. Yes.

Mr. ROBERTS. The Chair is, certainly, glad to know of your interest in this field, and would like to know if you have any suggestion as to why there has been difficulty in getting these uniform laws enacted?

Mr. WHITTON. Mr. Chairman, I can only speak from experience now in my home State of Missouri. Every year we will introduce or have introduced some legislation having to do with driver safety, like giving a certain number of points for being caught driving a car intoxicated or giving a certain number of points for being in a certain type of accident; and then having a certain number of points adding up to be a specified number, like 18 or 20, the driver loses his license for a period of time.

But I will swear we just have a terrible time getting anything passed. That is just the experience in Missouri.

I do know that the Bureau of Public Roads sponsored this meeting of the traffic people, traffic directors, and traffic judges. And I would like for Mr. Holmes to add to what I have said. But there is, certainly, a pulling back on the part of State legislators, as I envision it, from passing legislation that would tend to eliminate poor drivers, for one reason or another. I do not have the viewpoint of the State legislators, so I cannot say why.

Mr. ROBERTS. I think that is, probably, a fair statement of the situation as it is in many States.

Would you have any suggestion as to what the Bureau could do or is doing to encourage that?

Mr. WHITTON. Let me refer that to Mr. Holmes, if I may.

Mr. ROBERTS. Mr. Holmes.

Mr. HOLMES. As I think you know, Mr. Roberts, there is this National Committee on Uniform Traffic Laws and Ordinances. That was not the one Mr. Whitton referred to in his statement. But there is such a committee.

It has a very limited budget, a part of which is supplied by the Bureau of Public Roads. And as one of the contributors, we hold membership on the committee and on the executive committee.

During a recent meeting of the executive committee of that National Committee, within the last 2 weeks, plans were made to step up the activity very considerably. That committee has employed a new man to be its executive secretary which will enhance and enlarge the staff at its national office.

That committee has as its function the job of recommending a uniform vehicle code, or set of traffic laws, that will be in keeping with changing times and changing needs.

It, also, has the responsibility to follow the work done in the States, and to call the attention of State legislators to any proposals introduced in State legislatures that are not in conformity with the uniform vehicle code. And in that way, by trying to keep the code current and encouraging the States to follow the code, we hope to encourage more national uniformity.

There has been a pretty substantial acceptance of at least some parts of the Uniform Vehicle Code. One section called the rules of the road, for example, has had very wide acceptance and most States have a large part of it included in their laws.

There are still differences, however.

The only way that we could suggest is through continued persuasion to try to get the State legislatures to follow the code more closely than they now are following it, and also, to be sure that the code is up to date.

The executive committee instructed the staff to arrange for a meeting of the national committee during this coming year so that there will be a full-scale review of the code and a republication of the code with any changes that may be made. We hope that with the enlarged budget, which I hope we will get, we will be able to participate even to a greater degree next year and thereby help the committee do a better job.

It is mostly a matter of persuasion because it is a matter of State jurisdiction and authority.

Mr. ROBERTS. You may prefer not to answer this question. And if so, very well. If we are paying 90 percent of the cost of the roads, could you say, "In order for you to participate in the program," why would it not be required that "you adopt a uniform motor vehicle code"—and, if so, how long do you think it would take to get it?

Mr. WHITTEN. Mr. Chairman, it might be a wise policy for your committee to express the hope that you do not have to go to that end.

Mr. ROBERTS. I certainly would not like to put the pressure on anyone or any sovereignty but it does seem to me that the Federal Government would be entirely within its rights if it so chose to exercise it, in saying that it would be a requirement. We would hope, however, that it would not be necessary.

I understand that there is an activity now in the compact field that offers some hope. I was advised this past week one of the large State government groups has been polled and there is a very fine chance that the States will shortly enter into a compact with an agreement to adopt the uniform law.

Mr. WHITTON. Isn't that the 11 Western States—those Governors meeting here now?

Mr. ROBERTS. Yes.

Mr. WHITTON. Incidentally, Mr. Holmes, Mr. Chairman, is a member of that executive committee that he has been talking to you about.

Mr. ROBERTS. We are certainly happy to have him represent the Bureau of Public Roads in that capacity.

That is all I have. Mr. Rogers.

Mr. ROGERS of Florida. Thank you, Mr. Chairman.

Mr. Whitton, I read your statement. I was very sorry that I was not here when you presented it. And I find it very interesting in the background of history here, some of the efforts that the Bureau has made.

However, my concern, after hearing from GSA devoting no money to research, but works in cooperation with other agencies, and HEW is devoting about \$1.4 million—I am not sure it is all research in this particular field, however—it may not be devoted to automobile accidents, but it is accident prevention, however.

Your figure of \$3,727,000—I wonder how much of that was actually geared toward vehicle safety other than highway design of safety features?

Mr. WHITTON. May I refer it to Mr. Holmes?

Mr. ROGERS of Florida. Yes.

Mr. HOLMES. I would say, Mr. Rogers, that very little of ours is directed exclusively toward the safety of the vehicle itself. We felt that our responsibility was to the highway and its features, traffic control devices, and so forth.

Mr. ROGERS of Florida. Of course, I realize that highways mean a great deal to the prevention of accidents.

Mr. WHITTON. Divided lane highways: That is the other great contributor.

Mr. ROGERS of Florida. You certainly are to be commended for your work in that field.

Mr. WHITTON. Thank you.

Mr. ROGERS of Florida. However, I am concerned and I know the chairman is, too, about how little we are actually doing in our research programs to bring about greater safety factors in the vehicle itself. I wondered what plans you have to approach this problem.

Mr. WHITTON. Mr. Rogers, before you came I made the statement that I have just been here something less than 90 days, so I am referring those questions like that to Mr. Holmes, with your permission.

Mr. ROGERS of Florida. I realize that. It is difficult in the short period of time you have been here.

Mr. HOLMES. If I might speak to that then, Mr. Rogers, we have had the feeling that we must know more about the real causes of accidents than we can learn from the reports that customarily are made by the police and even by the police investigations. It was for that reason that we participated with Public Health Service and the Automotive Safety Foundation in the study at Northwestern University which we call the intensive investigation of accidents. That report is that thick one on the table here.

Mr. ROGERS of Florida. How many accidents did you investigate there?

Mr. PRISK. Forty-three.

Mr. HOLMES. Forty-three accidents, which seems like a pretty small number of accidents for that size book. But they were investigated with the hope that in such an approach we could prove whether or not it would be desirable to extend that type of research toward the determination of the fact of the extent to which each element of the system, whether the driver, the vehicle, or the highway, entered into the causation of the accident.

We find that there are still differences in interpretation of the extent to which the vehicle entered into it. But, undoubtedly, there is room, as was shown in response to a question Mr. Roberts asked—there is room for improvement in the vehicle as there is room for improvement in the other elements of the system.

Our plans would not include research into the vehicle itself, but we do hope to be able to participate with others who are interested in developing a better understanding of the extent to which each element does enter in. I think that is the limit to which we feel in our authority we should go.

Mr. ROGERS of Florida. I see. That is what I think we need to get at. We want to center the responsibility of research on these things. I feel now that as to the problem of research concerning safety with the vehicle itself, I am not sure where we would really go at the present time to have a really effective research program carried on. I think that is what we need to get to, if you feel it is not the Bureau of Public Roads.

Mr. WHITTON. We would like to have a part in that. I think we can make a contribution.

Mr. ROGERS of Florida. I presume in a cooperative way.

Mr. WHITTON. Yes; that is right.

Mr. ROGERS of Florida. But not the primary responsibility for the research? You are more concerned with highway design and the attendant problems there?

Mr. WHITTON. I think it is very helpful to get that clear, Mr. Chairman, so that we can face that problem.

Mr. ROGERS of Florida. I do wonder if, since there has been mention of this new commission that the President established—I guess it was President Eisenhower in December—do you feel that is really making an effective approach to this problem, or should we go ahead and try to work through our agencies and place the responsibility for this type of work on, say Commerce, or Health, Education, and Welfare, or GSA, and such as that?

Mr. WHITTON. I have not had an opportunity to talk with Mr. Hodges about it, but it would seem to me that the Interdepartmental Highway Safety Board ought to be effective in this business.

Mr. ROGERS of Florida. Are you familiar at all with the Board?

Mr. WHITTON. I know the agencies that are on there. I would assume that each Secretary would, possibly, designate someone within his organization; perhaps the Bureau of Public Roads in the case of Commerce.

Mr. ROGERS of Florida. This has not yet been done.

Mr. WHITTON. Not to my knowledge.

Mr. ROGERS of Florida. Is there a time schedule for it?

Mr. WHITTON. Not to my knowledge.

Mr. ROGERS of Florida. Has any action been taken up at the secretarial level that you know of?

Mr. WHITTON. I don't know, sir.

Mr. ROGERS of Florida. You have not been informed?

Mr. WHITTON. I have not been so informed.

Mr. ROGERS of Florida. Probably, yours would be the agency that would handle it in the Commerce Department.

Mr. WHITTON. I would certainly think we would have a part of it.

Mr. ROGERS of Florida. I notice that you state on page 2 of your statement that \$456,000 of funds have been devoted to certain research problems, including highway safety projects and projects which have overtones of safety being conducted by Public Roads.

And you state further that you are providing technical guidance and coordination with another amount.

Where is that type of research going on, the \$2.5 million?

Mr. HOLMES. For the most part that is work being done by the State highway departments under what we call the 1½ percent funds. Those are funds that are available for purposes of planning and research from Federal-aid funds apportioned to the States.

I might say in explanation to the statement about the overtones, I think is the word used, that we have a very definite feeling that most of the things that we do in highway design and in traffic control to improve the flow of traffic, to increase the capacity of the highway, are about the same things as we would do if we were concerned only with improving safety of the highways.

Fortunately, the two go hand in hand. So that we undertake a wide variety of such projects largely with the objective of increasing the ability of the highway to move traffic at reasonable speeds and in reasonable volume and produce as a byproduct improvements in safety as well. I suppose we could say that we started the other way and had as an objective the improvement of safety and as a byproduct to improve the capacity and other features of the highway. But the two we feel are very closely linked. So that the State highway departments, in the many traffic studies that they undertake with Federal-aid funds over which we do have the responsibility for technical supervision, do provide a great deal of new knowledge and, we feel, advancement in highway safety.

The majority of that expenditure is in that area, but we have agreed with Chairman Roberts to present any other available data showing the breakdown for safety research.

Mr. WHITTON. For example, on the Interstate System there is a requirement to pave the shoulders. It protects the pavement itself and makes it last longer, but a good byproduct is safety.

Mr. ROGERS of Florida. Yes. What amount of influence do you exert, would you say, in various States on speed limits on the interstate highways?

Mr. WHITTON. Will you speak on that, Mr. Prisk?

Mr. PRISK. In my capacity as secretary of the Committee on Traffic in the American Association of State Highway Officials, we are associated with a current study of speed limit regulations on the Interstate System. This is a committee of representatives from the State highway organizations, and the study was initiated because we have some concern about this problem of different speed limits in different States. It is a mutual problem among the States, and the study is now under way.

Mr. WHITTON. That would have an indirect effect. That is, the results of that study would have an effect.

Mr. ROGERS of Florida. It is the purpose then to exert influence on the speed limits?

Mr. WHITTON. That is right, to the extent that might be warranted. Can we talk off the record here?

Mr. ROBERTS. Yes.

(Discussion off the record.)

Mr. ROGERS of Florida. I wonder how far you felt the Bureau of Public Roads should assume leadership in that field?

Mr. WHITTON. I think we will through Mr. Prisk as secretary of the committee acquire gradually more uniformity. We acquired uniformity in the construction of the Interstate System by such a method, by getting all of the States to agree that they would build 12-foot lanes and a certain number of lanes for a certain amount of traffic and certain grades. Some are crying a little bit about it but most are complying. That is uniformity.

Mr. ROGERS of Florida. I think you did just a bit more than asking. You said you would not give them the funds unless they did meet it.

Mr. WHITTON. They set it up, Mr. Rogers, themselves, the States set them up. The Bureau approved and the Secretary of Commerce approved it. Then we said, "You follow the standards you set up."

Mr. ROGERS of Florida. The Bureau of Public Roads wrote that?

Mr. WHITTON. Yes.

Mr. ROGERS of Florida. You had a fair amount to say about the standards.

Mr. WHITTON. That is right, but the States themselves had recommended them.

Mr. ROGERS of Florida. I have enjoyed your statement and appreciate the helpful information. And I must say that my good friend Bill Hull has spoken most highly of you.

Mr. WHITTON. Thank you very much.

Mr. ROBERTS. I would like to thank you, gentlemen, for your action with reference to the Rhodes' bill which was cleared by this committee and which this committee supported in the House which became law.

I would like to commend you for the speed and the efficiency with which you have entered into that activity and I think it has made a tremendous amount of progress.

Mr. ROGERS of Florida. I know you probably mentioned it, but we would all like to see the Secretary bring about the installation of seat belts.

Mr. ROBERTS. I certainly concur in Mr. Rogers' comment. I feel that while many of these things, these approaches may not immediately change the picture, we never know which one will be the catalytic aid. I think we are beginning to see some light in this picture, particularly this year; and in the years to follow we want to see this horrible toll of deaths and injuries diminish.

Again, we want to thank you.

Mr. WHITTON. Thank you. May I add that I had seat belts put in my Government car the same day the Secretary did.

Mr. ROBERTS. I am glad you have employees who not only care about others but themselves.

The committee will stand in recess until 10 a.m. tomorrow.

(Whereupon, at 3 p.m., the committee adjourned, to reconvene at 10 a.m., Tuesday, April 18, 1961.)

MOTOR VEHICLE SAFETY STANDARDS

TUESDAY, APRIL 18, 1961

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY OF THE
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts (chairman of the subcommittee) presiding.

Present: Representative Roberts (presiding), Rogers of Florida, Schenck, Nelsen, and Dominick.

Mr. ROBERTS. The subcommittee will please be in order.

We are meeting this morning to continue our hearings on H.R. 903 and H.R. 1341. These hearings are designed to determine what the various executive departments are doing on safety, how they are spending and what results they are obtaining so far as research is concerned, so far as the overall matter of highway safety is in the picture.

This morning we will hear Mr. W. E. Albright, who will represent the Department of Defense. Mr. Albright is the Deputy Director of Safety of the Department of the Army and is from my State of Alabama.

He is accompanied by Maj. John Naler. We will be happy to hear you now.

Before the witness proceeds, I should like to take this opportunity to welcome to our Subcommittee on Health and Safety Mr. Dominick. We are delighted to have you with us. We appreciate the fact that you have been selected and have consented to come here. We appreciate your being here.

Mr. DOMINICK. I am delighted to be here, Mr. Chairman. I thank you.

Mr. ROBERTS. You may now proceed, Mr. Albright.

STATEMENT OF W. E. ALBRIGHT, DEPUTY DIRECTOR OF SAFETY,
DEPARTMENT OF THE ARMY; ACCOMPANIED BY MAJ. JOHN
NALER, OFFICE OF CHIEF LEGISLATIVE LIAISON, DEPARTMENT
OF THE ARMY, WASHINGTON, D.C.

Mr. ALBRIGHT. Mr. Chairman and members of the committee, my name is Wilbur E. Albright. I am Deputy Director of Safety for the U.S. Army. I am here this morning as a witness representing the Department of Defense, as the result of a letter from the committee chairman to the Secretary of Defense, asking for comments in

connection with H.R. 1341 and comments regarding what the Department of Defense is doing in the field of motor vehicle accident prevention and what steps we are taking in the design of safety devices for Government-owned motor vehicles.

First, I would like to speak not for the Department of Defense, but as a veteran safety official of more than a quarter of a century. I would like to express the appreciation of those in the safety field for the splendid support of the safety movement that we have always enjoyed on the part of this particular committee. It has always been a source of satisfaction and consolation to know that we have safety representation at this level and the benefits that have been afforded our safety movement cannot be described in words. We appreciate it very sincerely.

Concerning the first portion of my presentation it regards the position of the Department of Defense on H.R. 1341 which is simply this, that the position taken by the Bureau of the Budget as outlined in their letter of the 17th of April, to the chairman of the Committee on Interstate and Foreign Commerce, House of Representatives, is concurred in and endorsed by the Department of Defense.

Their position as stated by the Bureau of the Budget is simply this: We are in accord with the objectives of H.R. 1341, but are of the opinion that the establishment of standards covering motor vehicle safety devices and specifications incident thereto should remain under the authority of the Administrator of General Services. The staff of the General Services Administration works on a continuing basis with the manufacturers of motor vehicles, on technical and performance specifications, and it is not believed desirable nor feasible to separate standards and specifications of motor vehicle safety devices from the general standards and specifications responsibility of General Services Administration.

In view of this we suggest that H.R. 1341 be amended to substitute the Administrator of General Services for the Secretary of Commerce in sections I and II of the bill; and that the bill, so amended, be enacted.

That is the position expressed by the Bureau of the Budget and is concurred in wholeheartedly by the Department of Defense.

In the past the Department of Defense has objected to this bill, not necessarily objected to it, but we have expressed some concern as to whether or not it was essential. I think, primarily, our past objections were based upon the fact that we felt as if it was pointing toward the small end of the problem. We would have been more enthused had it been more inclusive and taken in privately owned vehicles as well.

I mention this simply because the fatalities that we experience in the Department of Defense as a result of Government-owned vehicles are minor compared to the number we have in privately owned vehicles. For example, for each fatality that we experience as the result of Government-owned vehicles we have 13 as the result of privately owned vehicles.

We would, certainly, be enthused if all motor vehicles could be included in this specification.

With reference to the second question that was contained in the letter from the committee chairman to the Secretary of Defense,

which has to do with what the Department of Defense is doing in the field of motor vehicle accident prevention, I might mention that the Department of Defense does not have a safety organization as such but it does have one in the various segments of the Department of Defense, each one maintaining a very active safety organization.

Even though safety responsibility has been delegated to the various Secretaries there still is maintained a close coordination on the part of the Secretary of Defense with a representative in the Defense Department Personnel Office assigned the responsibility of coordinating the functions of the various departments. And regardless of the fact that safety has been delegated out to the various Secretaries there still is maintained a close coordinated effort on the part of all of the departments in the field of special interests and of special emphasis. As an example of the coordinated effort on the part of the services I call your attention to the Commission on Accidental Trauma which is a part of the Armed Forces Epidemiological Board and the benefits that they have furnished in this capacity are legion. The Commission feeds all of the services with information obtained by studies and research conducted by men who are highly trained and specialized.

Among the many fields of study on accidental trauma is the field of motor vehicle safety which, perhaps, has received the greatest emphasis. And as an example of this I call your attention to the automotive crash inquiry research program at Cornell University, the thinking of which, I believe, has had a great deal to do with the preparation of this particular bill we are discussing.

This coordinated effort, also, pertains to areas of special weapons and problems of that nature which require joint safety precautions.

There is at the moment a joint study on the part of the three services under the coordination of the Secretary of Defense to determine what percentage of our military personnel fatalities are caused by the time they leave on pass and the time they return, looking into that to see if there may be a way of controlling the time that the individual serviceman leaves his station in order to go on leave and the time that he is to report back to eliminate as much night driving as we possibly can.

In addition there is a joint manual being prepared which contains chapters on safety, accident prevention, and reporting, and one on driver selection, training, and licensing and the Department of Defense instructions are published placing a requirement on each of the services to maintain an accident prevention program.

Other activities taken by the military services on an individual basis that have proved effective, includes such items as an attitude survey of military personnel which has been conducted to determine the effectiveness of methods used to combat privately owned motor vehicle accidents. It was rather revealing, to learn that the majority of the military personnel did not feel that the usual means used to promote a safety program, such as posters and memoranda and things of that nature served a useful purpose. They felt, that is, individual members felt, that the most effective approach would be a get-tough approach.

In connection with this particular study, it has attracted such attention, that an abstract of the survey has been published by the National Safety Council in their December issue of their Traffic Safety magazine.

Mr. ROBERTS. Could you furnish that information to the subcommittee?

Mr. ALBRIGHT. Yes, sir, I can do that.

Mr. ROBERTS. Thank you.

(The information referred is in the committee files.)

Mr. ALBRIGHT. The National Safety Council driver award program is endorsed by the Department of Defense and plays a major role in our promotional program. One particular service uses this award program throughout the entire service, and the other services leave it up to the individual installation or command. This driver award program includes an annual award for accident-free driving for all civilian drivers. It contains a code for professional drivers, a magazine on safe driving, a monthly letter containing important seasonal topics and a poster service.

In addition in the field of training, personnel are not only trained in the service schools, but we use the services of universities, such as the Traffic Institute which is maintained by the Northwestern University. We train civilian traffic officials in these schools.

In addition to this, motor vehicle safety is included in the chaplain's character guidance program from the moral responsibility standpoint, which we think is rather effective.

Our general training for drivers is threefold.

We have a prelicensing training program.

We have a refresher training program, and we have a remedial driver training program.

Timely circulars on motor vehicle safety are published, such as one that is being published at the present time which calls attention to a danger which we have been informed of by the Interstate Commerce Commission concerning drivers of flammable liquid carriers not stopping at railroad crossings. In addition to that, we publish circulars preceding long weekends and other holiday periods.

DOD supports national programs such as the national vehicle safety check, the slow down and live campaign, and the Armed Forces-State traffic safety workshops, which have also paid dividends.

One of our outstanding efforts, I believe, is the fact that the Army participated in the American Association of State Highway Officials' study on driver fatigue and performance in a 2-year study which was conducted at Ottawa, Ill. The study ran for 2 years, and represented a coordinated effort between the Army, public roads, the truck manufacturers, and the data is being processed at the present and we expect to develop a limitation as to the length of time that drivers can safely perform their duties on the road from the data that we will receive from this study.

Reporting procedures for accidents are being converted to the automatic data processing system to insure more accurate and more immediate information on accidents that we can use in our studies.

Civilian safety management career programs are being established to improve the quality of the safety personnel who are engaged in this particular field of work. Promotional material such as films, posters, and literature are widely distributed and offpost safety programs have been developed and they have been designed to stress the motor vehicle phase of the safety program.

There is at present a policy being established on the use of seat belts and should be forthcoming in the very near future.

Vehicle inspections are performed on a schedule that will insure against mechanical failure of the vehicles.

Regulations have been published on the prevention of Government-owned vehicle accidents and non-Government-owned vehicle accidents, and in connection with compliance with civil traffic laws.

Each service was represented on the American Standards Association Committee which was established to revise the national traffic and reporting standards. And each service cooperates so that we have an interchange system between services in the use of our safety films that we use in the training programs.

A couple of miscellaneous incidents in connection with this indicates the progress that is being made by the Department of Defense safety effort. One is the percent of reduction based upon the last 5 years of accident experience. We find that our Government motor vehicle accident rate, Department of Defensewide, has been reduced 16 percent during the last 5 years, and that our fatality rate—this is in connection with Government-owned motor vehicles—has been reduced 25 percent.

With reference to the privately owned vehicles used by Department of Defense personnel, the accident rate over the last 5 years has been reduced 28 percent, and the fatality rate has been reduced 19 percent.

I believe an indication of the progress that has been made on the part of the Department of Defense in connection with our accident prevention effort may be illustrated by the fact that 5 years ago, the President of the United States established a safety award to be presented for outstanding safety achievement each year. During the 5 years that the Presidential award has been in effect, the Department of Defense has won it four times. The Army has won it twice; the Navy has won it once; the Air Force has won it once. We have been informed that all three of the services have again maintained a reduction in their accident frequency rates to such a degree that we have all three been nominated for this award again this year, and only time can tell whether or not one of us will win it again.

In closing my comments, I would like, if I may, to correct what I think and what the Department of Defense thinks is a misconception as to the part played in safety by our military drivers. It is publicized by insurance companies and others that the military drivers are perhaps the worst drivers there are in the world.

This is a statement that I feel is a misconception, and if it is in order, I would like to go on record before this committee justifying the position that I take, that it is not a true statement. I base this primarily on an article entitled, "The Case for the GI Driver," which was published in the Army Personnel Letter of January 1961, and it is submitted as a matter of record, if it is appropriate to do so.

I call attention to the fact that although rumor has it that servicemen are among the poorest, if not the worst, drivers on our streets and highways, we would like to look at the facts. I quote from the article:

As a group, drivers under 25 are more frequently involved in accidents and show higher accident rates than would be expected on the basis of their numbers in the driving population. A very high percentage of servicemen are in the under 25 years of age group, who are responsible for the major portion of the highway accidents. But we would like to bear in mind that soldiers or military drivers in uniform are easily recognized—military drivers by virtue of their distinctive uniform and the identification on the bumper or windshield

of the car which is readily recognized, whereas the millions of other drivers of the same age are not so easily recognized.

Because of this ease of identification, the servicemen may have become the scapegoats of an accident-weary public, ready to assign blame for the traffic accident problem. No other group, ethnic, religious, or occupational, is so singled out.

That the driving performance of the under 25 serviceman is in need of improvement is acknowledged; that his record is poorer than that of his driving contemporaries has not been proved.

These servicemen entered the service after 18 or more years in civilian life, where he was under the influence of his family and the community. He brought most of his knowledge, skills, and attitudes that relate to driving—and his driver's license—with him to the military service. It is the public, not the military, which determines who shall be issued a license, and the requirements an applicant must meet to obtain this certificate. The Army examines, selects, trains, and supervises the drivers of its Government-owned vehicles; however, controls of this sort are almost totally absent in the case of the serviceman operating his own vehicle. The result—accident experience for Army vehicles is one-half that of motor vehicle fleets reporting their experience to the National Safety Council. Last year, Army motor vehicles were driven some 130,000 miles for each accident reported.

The serviceman's private motor vehicle problem is not exclusively a military problem; rather it is a part of the total traffic problem of the Nation. Accordingly, the solution is one which must be shared by the military and the civilian community. Improved licensing standards and driver controls offer the best hope for reducing accident experience among all drivers, military and non-military alike.

As an example of the point that I am trying to stress before the committee, I mention the fact that there were more fatalities from motor vehicle accidents in my daughter's high school graduating class in Huntsville, Ala., than there were among all of the thousands of military personnel stationed at Redstone Arsenal during the 9 years that I directed the safety program there. This is a problem that I think we all should consider.

This completes the remarks from my notes, Mr. Chairman. If there are any questions from the committee, I would be glad to attempt to answer them.

Mr. ROBERTS. Thank you, Mr. Albright. You have been very helpful to the committee. You have presented it quite well.

I would like to ask a few questions. As I understand it, the Department of Defense approves the bill with the exception that they would prefer the bill be amended to put the authority, the power to carry out the objective of the bill, in the General Services Administration, rather than in the Department of Commerce; is that correct?

Mr. ALBRIGHT. That is correct, sir.

Mr. ROBERTS. Do you think that the General Services Administration should rely on the Society of Automotive Engineers, the American Standards Association, or set up a staff of its own, to pass judgment on safety features, after hearing the engineering societies, the testing associations, the public, and the manufacturers and others interested in the matter?

Mr. ALBRIGHT. My personal feeling, Mr. Chairman, is that there are people in the Government service who are qualified and that they may be called upon to assist in this particular field. For example, in the Bureau of the Budget's comments on this, they state that in furthering the objective of this legislation, it is their understanding that the General Services Administration intends to solicit advice and recommendations from the Interdepartmental Highway Safety

Board, which was established by Executive Order No. 10898, December 2, 1960, in which, among other responsibilities, is required to provide leadership to and to coordinate the traffic safety aspects of programs carried on by the departments and agencies of the Federal Government, and that advice from this Board which is chaired by the Secretary of Commerce should be of material assistance to the General Services Administration in promulgating standards covering safety devices and in the preparation of suitable specifications in connection therewith.

In addition to that, I am sure that all of the agencies of the Government who have men specially trained in this field would gladly volunteer their services.

Mr. ROBERTS. Do you believe, however, that the General Services Administration, after consulting with the using agencies, should have the discretion to make the final judgment on the safety feature itself?

Mr. ALBRIGHT. Yes, sir; I think so. I make this statement because of the fact that the vehicles are used differently by different agencies, and they may be required to procure safety devices that, due to the use of the particular vehicle, would not be necessary in other vehicles.

Mr. ROBERTS. I suppose you have in mind a situation, for instance, such as the Post Office Department, in using a particular type of vehicle, might have a type of vehicle that would not lend itself to use by another agency or department. They are required to stand most of the time, and I cannot conceive that there would be much point in putting on those vehicles a safety belt, in that type of operation.

Mr. ALBRIGHT. That is right, sir. We have other classes of vehicles that are used in different service, such as in the Geodetic Survey in the Tropics where there is nothing over the top but a piece of canvas. We would oppose putting safety belts in that particular type of vehicle because in case of rollover they need to be able to leave these vehicles in a hurry.

Mr. ROBERTS. And you feel that they would be better qualified to obtain the particular equipment because it is their job to procure them in the first instance?

Mr. ALBRIGHT. That is the general opinion expressed by the Bureau of the Budget, and the Department of Defense endorses that.

Mr. SCHENCK. Will you yield there?

Mr. ROBERTS. I will gladly yield.

Mr. SCHENCK. You refer to the fact that in the Geodetic Survey vehicles, they have only a piece of canvas for the top on their vehicles. Could you not insist upon rollover bars there?

Mr. ALBRIGHT. That could be an answer, a solution. Rollover hoops are available and may be procured to be installed on vehicles of that type.

Mr. SCHENCK. Would you not feel that might be important, or does the record show that it is not necessary?

Mr. ALBRIGHT. I do not think that our record would prove it unnecessary, sir. However, it is an added safety feature, and we could not certainly object to it.

Mr. SCHENCK. That is all of the questions I have. Thank you.

Mr. ROBERTS. You mentioned one thing in your testimony that we had previously discussed with the commanding officer at Wright Field

in our hearings that we had in Dayton, Ohio, with reference to the type of training for servicemen going on leave.

Instead of giving their leave to them in the usual way, having it occur on the weekends, have any plans been developed in the Department of Defense that would stagger that situation so that the serviceman would go out, perhaps, during the middle of the week, or some other time during the week, instead of the weekends, and then have it changed at the last minute and having him drive night and day, trying to get back in time for his tour of duty?

Mr. ALBRIGHT. A temporary study made in connection with that problem raises a question as to whether or not it is actually a problem. However, to determine whether or not it is a problem, we have in process at this moment a 6-month period of maintaining records of these types of accidents, to determine for sure whether or not it is a problem. If it is, we will definitely take action.

The reason I say there is a question in regard to it being a problem is that the records we have at the moment do not reveal it as a problem. We have a number of people killed who are night driving when on leave or on pass, but the indications from our records are that these people who are being killed are people who live in the community. They are off for a holiday week at home; they are not going any place except around their local community.

The major portion of our people who are killed in night driving in the military services, according to our records that we have at the present time, indicate that there are very few who are pressing to get home or to get back to the station on a time limit.

We are concerned with this, and the Department of Defense is coordinating a study on the part of the three services at this moment to determine whether there is an actual need for this or whether there is not.

Mr. ROBERTS. About how many passenger-type vehicles are purchased by the Department of Defense?

Mr. ALBRIGHT. I am sorry; I do not have that information with me. I can furnish it for the record.

Mr. ROBERTS. We would like to have that for the record.

Mr. ALBRIGHT. We will furnish it.

(The information referred to follows:)

The following figures represent the number of passenger-type motor vehicles included in the budget for fiscal years 1960, 1961, and 1962:

	Fiscal year 1960	Fiscal year 1961	Fiscal year 1962
Sedans.....	2, 675	2, 870	4, 374
Station wagons.....	1, 426	1, 153	1, 572
Buses.....	787	1, 324	1, 739
Ambulances.....	190	453	629
Total.....	5, 078	5, 800	8, 314

Mr. ROBERTS. I know you are not in the procurement end of this, but do you, in your opinion, believe that the addition of reasonable safety devices, such as seat belt attachments, safety type locks on the doors, crash padding, roll bars, would appreciably increase the cost of the vehicles used by the Government?

Mr. ALBRIGHT. Of course, I know that it would increase it some, but I doubt very seriously whether the addition of these devices would increase it beyond the limitations stipulated for the procurement of the vehicle. I believe that most of the vehicles purchased now are purchased at a price under the stipulated limit. I do not think it would increase it more than that limit. If it did increase it, why, the cost would certainly be offset by the savings involved.

Mr. ROBERTS. Those are all of the questions I have. Do you have any questions, Mr. Nelsen?

Mr. NELSEN. No questions.

Mr. ROBERTS. Mr. Dominick?

Mr. DOMINICK. I have a couple of questions, Mr. Chairman.

In connection with the safety features mentioned in fairly general terms, such as the seat belts, and rollover bars, and crash padding, and safety type door locks, do you have any other thoughts on what types of devices might be included within this category?

Mr. ALBRIGHT. In connection with this legislation, I assure you that there should be some dividing line be made as to what is considered a safety device. Definitely a windshield wiper is a safety device; a horn is a safety device; a windshield washer is a safety device. You can enumerate I do not know how many items on an automobile that, in the broad sense of the word, would be considered for the purpose of safety.

The brakes, for example—all of these things. Your sideview mirror, your rearview mirror. But in this particular legislation, I believe something should be done to specify what the minimum standards should be in connection with this.

Mr. DOMINICK. Let me ask you just a few more questions, if I may.

Has any thought been given in connection with this legislation that a safety device might include an antipollution device on the exhaust system?

Mr. ALBRIGHT. To my knowledge, it has not been considered in connection with this. Some member of the committee would have to answer that, because I do not know what has been included.

Mr. DOMINICK. Has the Government done any research work on this particular problem, that you know of, in connection with this bill or otherwise?

Mr. ALBRIGHT. I do not know. I will have to get that information for you. There is research being done in connection with the control of the poisonous fumes from the exhaust pipe, but I do not know what role the Government is playing in this research work. I will have to supply it for you.

(The information referred to follows:)

The Division of Air Pollution of the Public Health Service, Department of Health, Education, and Welfare has been engaged in research and development for several years on the problem of emissions of motor vehicle exhausts. The research covers the exhaust from both the tail pipe and the blowby from the crankcase. Information is being furnished other Government agencies on a continuing basis through the Interdepartmental Committee on Air Pollution.

Mr. DOMINICK. Has the Government, to your knowledge, contemplated any research on different types of night lights, as to whether they would be good or bad?

Mr. ALBRIGHT. That I cannot answer, either. I believe they have accepted the research of the outside agencies on that as standard equipment.

Mr. DOMINICK. Those are all of the questions I have. Thank you.
Mr. ROGERS of Florida. As I understand it, you are with the Department of the Army?

Mr. ALBRIGHT. Yes, sir.

Mr. ROGERS of Florida. And the Army has been chosen to be the coordinating branch for the entire Department of Defense; is that correct?

Mr. ALBRIGHT. That is right, sir; that is, at this hearing. The Army, of course, does not control the whole safety program, except at this hearing I am representing the Department of Defense.

Mr. ROGERS of Florida. Do you have a coordinating committee?

Mr. ALBRIGHT. I mentioned that in the first part of my statement. The Department of Defense safety program is decentralized. The responsibility and the authority is clearly delegated to each one of the Secretaries. However, the Department of Defense maintains a coordinating agency in their Personnel Division; the Deputy Director of Personnel for the Department of Defense is the person who coordinates the general efforts on the part of the services.

Mr. ROGERS of Florida. Do you do any research in the Department of the Army on safety?

Mr. ALBRIGHT. Yes, sir. The Department of Defense has the Armed Forces Epidemiological Board which has a Commission on Accident Trauma, and they use the brains of the world in this particular field in doing research and handing it down to the various services.

Mr. ROGERS of Florida. That is the only research that you know of?

Mr. ALBRIGHT. We do other research. I could not tell you for a fact how much we are doing that would concern this particular bill, because our special purpose tactical vehicles are excluded from this bill. When a tactical vehicle is designed for a special purpose, human engineering plays a major role in the design of that piece of equipment and human engineering is playing a larger role in the design of the equipment every year.

Mr. ROGERS of Florida. I was thinking not necessarily of restricting it to this bill, but your program of research safety for vehicular matters.

Mr. ALBRIGHT. We depend on the Armed Forces Epidemiological Board, and the Commission on Accidental Trauma who do that research for us, plus other studies that we make. One I mentioned was the study of the attitudes of servicemen as to the effectiveness of the measures that are used in accident prevention. Another one was the study on the part of the truck manufacturers, the Army and Public Roads in the field of fatigue and performance of drivers. That was a 2-year study just completed. They are compiling the data now to be used in this field.

So we do a great deal of study and research of this nature.

Mr. ROGERS of Florida. How many people are there in your office? What is the size of your staff?

Mr. ALBRIGHT. My staff?

Mr. ROGERS of Florida. On this work?

Mr. ALBRIGHT. My staff in the Department of the Army Headquarters offices consists of 10; 6 action people and 4 clerical. However, our Army safety program is decentralized, too.

We have such organizations as the Nuclear Weapons Coordination Group for Safety. We have a safety organization in the Continental Army Command. And we delegate all this responsibility to each command. We follow the command channel all the way down to the unit level, if you please. And the other services do the same thing.

Mr. ROGERS of Florida. Thank you very much. That is all.

Mr. ROBERTS. Thank you, Mr. Albright. Do you have any breakdown as to fatalities in there, and injuries, broken down by whether or not they occurred on the base, the installation or outside of those?

Mr. ALBRIGHT. Yes, sir. I have those figures in my office. They are very revealing. I would be glad to furnish you the figures in that connection. I do not have them with me today.

Mr. ROBERTS. If you will do so, we shall appreciate it.

Mr. ALBRIGHT. We know that there are far more off post than on post.

(The information follows:)

Figures obtained from the Army, Navy, and Air Force indicate that off-post accidents are responsible for approximately 98 percent of the motor vehicle deaths experienced by the Department of Defense.

The latest figures available pertaining to the percentage of on-post as opposed to off-post accidents indicate that approximately 60 percent of such accidents occur on-post and 40 percent off-post. This estimate includes only those accidents resulting in damages of \$25 or more to Government-owned vehicles and does not include a number of off-post accidents involving privately owned vehicles since there is no requirement to report such accidents unless they result in a disabling injury to military personnel.

Mr. ROBERTS. Thank you again very much for being here and furnishing us with this information.

Mr. ALBRIGHT. Thank you.

Mr. ROBERTS. Our next witness today is Mr. Ernest G. Cox, Chief, Section of Motor Carrier Safety, Interstate Commerce Commission. With him, I understand, he is accompanied by Mr. Herbert Qualls, Director of the Bureau of Motor Carriers, and Mr. Dale W. Hardin, congressional liaison officer.

STATEMENT OF ERNEST G. COX, CHIEF, SECTION OF MOTOR CARRIER SAFETY, INTERSTATE COMMERCE COMMISSION; ACCOMPANIED BY HERBERT QUALLS, DIRECTOR OF THE BUREAU OF MOTOR CARRIERS, AND DALE W. HARDIN, CONGRESSIONAL LIAISON OFFICER, INTERSTATE COMMERCE COMMISSION

Mr. Cox. Mr. Chairman, and members of the subcommittee, my name is Ernest G. Cox. I am Chief of the Section of Motor Carrier Safety in the Bureau of Motor Carriers of the Interstate Commerce Commission. I have served as Chief of that Section since December 1951, and prior thereto worked in the field staff of the Commission's Bureau of Motor Carriers from 1939. Chairman Everett Hutchinson regrets that he was unable to be here personally, but, as he stated in his letter of April 4 to Chairman Roberts, a previously scheduled oral argument before the entire Commission has prevented his being here.

I am appearing today to discuss the safety activities of the Commission, giving particular attention to (1) driver competency and physical fitness, (2) vehicle design and equipment to promote safety,

and (3) safety inspections of vehicles. The duties and the jurisdiction of the Interstate Commerce Commission with respect to highway safety are specified in section 204(a) of the Interstate Commerce Act (49 U.S.C. 304). Paragraphs (1) and (2) of that subsection specify it to be the duty of the Commission to establish for common and contract carriers by motor vehicle—

reasonable requirements with respect to qualifications and maximum hours of service of employees and safety of operation and equipment.

Paragraph (3) states it to be the duty of the Commission—

to establish for private carriers of property by motor vehicle, if need therefor is found, reasonable requirements to promote safety of operation, and to that end prescribe qualifications and maximum hours of service of employees, and standards of equipment.

Paragraph (3)(a) provides that the Commission shall establish—
for carriers of migrant workers by motor vehicle reasonable requirements with respect to comfort of passengers, qualifications and maximum hours of service of operators, and safety of operation and equipment.

The Commission first prescribed regulations governing common and contract carriers of property and passengers as to qualifications of drivers, reporting of accidents, and standards of equipment, to become effective in 1937. Maximum hours of service regulations became effective March 1, 1939. As to private carriers of property, the Commission made the required finding of a need for such prescription and prescribed regulations, approximately equivalent to those applicable to common and contract carriers, to become effective October 15, 1940. Thus, as to common, contract, and private carriers, safety regulations have been in effect for more than 20 years.

Regulations to establish reasonable requirements as to comfort of passengers and safety of operation of carriers of migrant workers became effective in 1957, following legislation approved August 3, 1956.

Leadership: The Interstate Commerce Commission has regarded its responsibility in this field not only as merely prescribing regulations and enforcing them, but also as providing leadership for basic safety regulations in the commercial vehicle field. In its 69th annual report to Congress, 1955, at page 50, the Commission said:

Our function in the prevention of commercial vehicle accidents is of vital importance. It is unique, and it complements but does not duplicate the activities of the States in the attainment of the objective of safety on the highways. We deal with basic accident cause factors peculiar to highway transportation, which only a Federal Government agency can effectively control through examination of records and properties of carriers at places located outside the jurisdiction of the States through which they operate. By investigation we determine the causes of accidents occurring throughout the Nation, and through such investigations and knowledge gained thereby develop and improve equipment and driver standards. Every State agency is limited by its own State borders, whereas we are concerned with highway transportation crossing the lines of all the States. Our function has to do, for example, with maximum hours of service, as contrasted with enforcement of traffic regulations by State and local police. We need the cooperation of State agencies, but it is our obligation to exert leadership and to establish standards in the interstate field. The State agencies look to us for this leadership.

This leadership has been exerted in a number of ways, some of which I shall describe briefly.

As to driver standards, the Interstate Commerce Commission has long maintained a high level of physical qualification requirements. Although practically all States will license a driver who has lost the

sight of one eye, or who has suffered the amputation of an arm or leg, for more than 20 years the Interstate Commerce Commission has required that, as to interstate commercial driving, a driver, among other things, shall have sight of a specified degree in both eyes, and must not have suffered the loss of a hand, a foot, a leg or an arm. Periodic examinations by licensed doctors are required. Identical or equivalent regulations have been adopted by the regulatory commissions of a considerable number of States for application to commercial vehicle operations subject to the jurisdiction of such commissions. Examples are Arkansas, Arizona, Kentucky, Georgia, and California, the public service commissions of which have adopted the ICC requirements as to driver physical qualifications verbatim.

Following a series of serious truck runaway accidents in 1954 and 1955, one of which occurred on the streets of San Francisco involving an Indiana-based truck, and which resulted in the death of seven persons, and one near Cumberland, Md., involving an Ohio vehicle, which killed five, after consultation with manufacturers of vehicles, manufacturers of brakes, and motor carriers, the Commission in May 1956 adopted a requirement for a warning signal and devices to provide manually and automatically applied emergency brakes in the event of loss of air pressure. This requirement has since been adopted by the Public Service Commissions of Arizona and New York State. Furthermore, a panel of experts acting as advisers to a subcommittee of the National Committee on Uniform Traffic Laws and Ordinances, is in process of recommending to that committee incorporation of a requirement equivalent to ours in the Uniform Vehicle Code.

Also this Commission has taken the lead in developing regulations providing greater safeguards, in addition to basic requirements, in the transportation of explosives and other dangerous articles. The volume of explosives, liquefied compressed gases, corrosive liquids, poisons, radioactive materials, and oxidizing materials transported by highway is very substantial. In general, considering the volume of such transportation, the highway transportation of such materials has been conducted with reasonable safety, although a good record was tragically marred by a disastrous explosion at Roseburg, Oreg., on August 7, 1959. This involved a Washington truck and driver, who ignored specific Commission regulations by leaving the vehicle on a city street. To the extent that there are State requirements relating to the transportation of such materials, they are largely patterned after those of this Commission.

Educational effort: In recognition of the fact that the safety regulations of the Commission are applicable to the operations of an estimated 137,000 motor carriers, of which number less than 20,000 are required to obtain operating certificates or permits from the Commission, a special effort has been made to communicate the basic requirements of the Commission's safety regulations to these motor carriers. One phase of this has been the careful investigation of many major accidents involving interstate carriers and the publication of reports detailing the causes and consequences of such accidents.

These reports have wide circulation in the motor carrier industry and are mailed to associations of motor carriers, to many individual motor carriers, to State regulatory commissions, State enforcement officials, vehicle manufacturers, labor unions, and insurance firms.

They are put to various practical uses. Motor carriers often have commented on their value in the training of supervisory personnel and drivers. In many cases they request additional copies; and, in other cases, they reproduce the reports for distribution to their personnel.

To maintain close cooperative relationships with State commissions, and to assure competence by our own staff, twice each year an orientation and training course is conducted by the Bureau of Motor Carriers. It is attended by representatives of State commissions, on invitation, as well as our own trainees. This month representatives of 11 States will participate in such a course.

Driver competence and physical fitness: The regulations of the Interstate Commerce Commission as to driver qualifications are minimum requirements. They are designed on the principle that they are applicable to carriers who employ drivers and that the carrier is subject to the jurisdiction of the Interstate Commerce Commission. A driver, as agent of the carrier, also is subject to the regulations and must comply with them.

In addition to the specified physical and competence standards, the regulations require that a motor carrier shall take into account the following considerations where they exist: (1) Violations of laws or regulations governing the operation of motor vehicles of which the driver is guilty; (2) the driver's accident record insofar as it tends to establish a lack of concern for, or indifference to, his own or the public safety; and (3) violations of criminal laws of which the driver is guilty. The carrier is required, periodically, to review the driver's record and, particularly, in connection with serious accidents.

The subcommittee chairman has inquired particularly about the efforts of the Commission to keep chronic lawbreakers and habitual users of drugs and alcohol from driving vehicles subject to the safety regulations of the Commission. First, the clear requirement of the Commission regulations is that such persons are not eligible under the minimum qualifications. The Commission does not license individual drivers. Its regulations are based on the fact that the motor carrier is subject to regulation, and the carrier is required to see that the regulations relating to qualifications of drivers are observed. An example of a Commission expression on this point is found in Motor Carrier Accident Investigation Report No. 41, which involved the use of a driver whose background demonstrated his lack of fitness for employment as an interstate driver. The carrier's management defended his retention on the ground that terms of the union contract made it impossible to remove him after they learned of his background. The Commission's report said:

We wish to make it clear that we do not consider any carrier to be excused from its obligations to insure that its drivers are qualified and its vehicles are safely operated by virtue of any obligation it has assumed in its contract with an employee union. In the area of safety of operation, the carrier's obligation to the public and its ability to abide by the provisions of the Interstate Commerce Act and our regulations thereunder must remain paramount.

These reports occasionally have concerned accidents resulting from the use of amphetamine drugs by drivers. In fact, the investigation of such an accident which occurred at Fayette, Ala., on July 24, 1953, and the publication of a report thereon, was a factor in stimulating the initial drive of the Food and Drug Administration against the unlawful sale of amphetamine drugs to truck drivers. Other recent

reports have emphasized the extent to which use of these drugs contribute to the occurrence of serious accidents. One of these was the collision of a truck transporting cattle with a bus near Tucson, Ariz., on December 20, 1959, resulting in nine deaths. We regularly report to the Food and Drug Administration those cases in which we learn of the use of such drugs.

Hours of service regulations: The Commission's regulations relating to maximum hours of service are fundamentally important. It has been particularly difficult to obtain compliance with them because of the incentive to truckdrivers and carriers to operate in excess of their limitations. The use of amphetamine drugs, where it exists, is often for the purpose of defeating these regulations. Because of the importance of the hours of service rules and the need for immediate correction of violations, the Commission has proposed a regulation to authorize its staff to remove from service, on the spot, drivers found to be operating in violation of these rules. This proposal has met with opposition from management and union officials. Hearings on this and other hours of service proposals were held in May, June, and July 1960 and a recommended report of the hearing examiner is now awaited. However, this is an area in which the Commission has exercised vigorous enforcement action in the courts and has prosecuted motor carriers and drivers alike for serious violations of these regulations. It has recently turned its attention to prosecution of drivers on a second offense basis and has met with success in the cases brought in court.

Regulations relating to vehicle design: The Commission's safety regulations specify minimum requirements which must be met with respect to lighting devices, reflectors, and electrical equipment, brakes and brake components, glazing and window construction, fuel systems, coupling devices and towing methods, miscellaneous parts and accessories, and emergency equipment.

The regulations specify that additional equipment and accessories, not inconsistent with requirements of the Commission, may be used, provided they do not decrease the safety of operation of the motor vehicles on which they are used. We have previously mentioned the improved requirements for combination vehicle braking equipment established by the Commission order of May 21, 1956.

We found, from accident reports filed by motor carriers, that a large number of accidents resulting in substantial property damage and, in some cases, in fatalities, resulted from vehicles rolling away from parked positions at such locations as restaurants and truck service stops. Therefore, in 1959 we substantially strengthened the regulations requiring adequate parking brakes.

Another major revision of our equipment requirements relates to lighting devices. On September 30, 1960, the Commission adopted an order completely revising the lighting regulations for commercial vehicles. These revised regulations are to be effective July 1, 1961. They contain a requirement that vehicles must be equipped with a switch or combination of switches for causing the simultaneous flashing of front and rear signals as a vehicular traffic hazard warning. This is the first time that any legal requirement has been established, on a mandatory basis, for providing the means and for making use of this type of signal.

These lighting requirements go beyond the provisions of the Uniform Vehicle Code. However, a panel of experts, even before the regulations have become effective, is already proceeding with the development of recommendations to incorporate these requirements in the Uniform Vehicle Code in the hope that individual States will see fit to adopt them for application to intrastate operations.

For many years we have advocated, and have consistently endeavored to encourage, State adoption of regulations identical to or the equivalent of those of the Commission.

Similarly, we are convinced that our requirements for fuel systems and the components thereof are of vital importance. We prescribe a severe test for side-mounted gasoline tanks. In addition, they must be certified as meeting the requirements of the Commission. A study of the accident reports filed with the Commission by motor carriers shows that accidents which result in fire are more than five times as costly, as to property damage, on the average, as nonfire accidents. Ours is the only Government agency to prescribe such regulations, except to the extent that some States have adopted our rules.

Safety inspections of vehicles: Since the beginning of the Commission's safety regulation of motor carriers, it has carried on, to the limit of its facilities, inspections of vehicles actually operating on the highways and inspection of maintenance practices, hours-of-service records, and other records of motor carriers at carriers' headquarters. For much of the period between 1939 and 1955 our ability to do this was limited by an extremely small staff. In 1956 and 1957 Congress voted additional funds to enable the Commission to increase its staff for this work.

Beginning in 1956 we began an intensive program of vehicle inspection. This was occasioned by conditions found in investigation of serious truck runaway accidents. Our published report on an accident of July 24, 1954, at Liberty, N.Y., described the badly neglected condition of brake chamber diaphragms, a hidden component. Our reports on the accidents of May 27, 1955, in San Francisco, and October 19, 1955, at Cumberland, Md., contain pictures of badly deteriorated air hoses leading to brake chambers. With this background we not only made the regulation modification referred to previously but instituted a program of vigorous and very thoroughgoing vehicle inspections with much of it carried on on the highways in the form of nationwide road checks, with our entire field staff participating. Since 1957 we have made detailed inspections of about 60,000 vehicles per year, with about 40,000 of these being inspected in the course of nationwide road checks. Vehicles found to be imminently hazardous are removed from service on the spot and may not be operated until repairs are made.

Each year we have conducted a separate road check relating to buses. In 1960 we made inspections of 8,786 buses. Of this number 174 vehicles were taken out of operation until hazardous mechanical conditions had been remedied. The 174 vehicles taken out of service constituted 2 percent of the total number inspected, a marked improvement compared with the 3.2 percent removed from service in the inspections of 1959.

Late in 1960 we instituted a program of vehicle inspections on major turnpikes. We have been convinced that many vehicles operating over the turnpikes were escaping adequate inspection because of our in-

ability to reach them on such highways. However, through arrangements with the Pennsylvania Turnpike Commission we made an inspection for 3 days in November 1960. We already have completed arrangements for such inspections on the Pennsylvania, Ohio, and Indiana toll roads in the near future.

With respect to the nationwide road check of property-carrying vehicles in June 1960, we published data to show that there had been a progressive improvement in the percentage of vehicles removed from service insofar as authorized carriers and private carriers of property are concerned but that there had been a worsening in the percentage of vehicles of exempt carriers removed from service between 1959 and 1960. Our enforcement program has continued to emphasize all types but much more attention is being given to exempt and private carriers in recent years than previously was the case.

The Commission has also had a major responsibility in the adequate regulation of carriers transporting explosives and other dangerous commodities. Substantial volumes of these materials move by motor transport. We have continued to give the utmost attention possible to such carriers and their compliance with the safety regulations. In a number of cases, the fitness of authorized carriers has been challenged when they have applied for extension of operating rights. Applications which have been denied by the Commission for lack of compliance with the safety regulations have, we believe, had a profound and far-reaching effect. The Commission also has directed that attention to the safety compliance of motor carriers shall be taken into account whenever carriers apply for temporary authority to extend their operations on the basis of an immediate and urgent need.

During 1960, 378 criminal or civil cases were filed in the Federal courts against motor carriers and drivers for violations of our safety regulations. The investigations from which these cases resulted were made by our staff.

Our study of accident reports frequently results in our communicating with the Bureau of Public Roads and, through it to State highway authorities, regarding the need for highway design, marking, or signaling improvements. We also have communicated to manufacturers of vehicles and components conditions which have appeared to us to warrant changes in design. These suggestions and recommendations have been on a cooperative basis, but have met with considerable success in obtaining design changes in vehicles and also in highway improvements.

The Commission has no facilities with which to carry on research and no funds with which to finance research by other Government or private agencies for it. However, recognizing the vital need for research and the knowledge gained thereby, we have availed ourselves of the facilities of other agencies of the Government to some extent and have obtained the cooperation of privately financed technical associations. When the Commission adopted its regulations relating to emergency brake functions in May 1956, it took note of the differences of opinion between the proponents of different systems. As a consequence, we arranged with the Bureau of Public Roads to carry on brake research in its laboratory and in field experiments. We obtained the advice and assistance of an industry advisory committee. We supplied the service of a mechanical engineer. The manufacturers

of vehicles and the Department of the Army furnished vehicles for the conduct of actual highway tests. Manufacturers of brake components loaned equipment for use in the laboratory. We expect to obtain valuable information from this work. Industry sources also, at our request, are now conducting experiments looking toward the development of a portable light intensity measuring device to fill a long existing inspection need.

In conclusion, we invite the attention of the subcommittee to information contained in the Commission's 74th Annual Report to Congress, concerning the results of our safety work insofar as they can be measured by information available to us. We obtain accident reports only from for-hire carriers—about one-seventh of the total number of carriers subject to our regulation, but who, we believe, carry on the largest proportion of the interstate business. A chart on page 138 of the annual report shows that in the 5-year period ending with 1959, property carriers reporting data to the Commission operated 38½ billion vehicle-miles, 25.2 percent more than the miles for the preceding 5 years. In the later period, despite the mileage increase and despite the increase in total use of the highways, carriers reporting accidents to the Commission reported 2.1 percent less fatalities than in the earlier 5-year period. In the case of buses, in the 5 years ending with 1959, miles decreased by 15 percent but fatalities decreased by 30.1 percent under the previous 5 years.

Beyond and in addition to the results shown by these data, we are convinced that our work has produced far-reaching beneficial safety results not capable of demonstration by statistics. Thousands of carriers subject to our safety jurisdiction do not report either accidents or mileage data, so any improvement in their experience is not reflected. The effect we have had on truck and bus design has been felt far beyond the vehicles operated in interstate and foreign commerce, as once a vehicle design or component design is changed the increased safety resulting therefrom benefits all users. So, also, is the effect of our driver standards carried to those governed by State agencies which adopt them. Yet, although excellent results have been achieved, we recognize that much vitally important work still remains to be done to continue to prevent loss of lives, avoid injuries, and curtail property losses. I am sure it will be the purpose of the Commission vigorously to press toward this objective to the fullest extent of its powers and facilities.

Mr. Chairman and members of the subcommittee, we appreciate this opportunity of appearing here today to discuss this important subject. If there are any questions, I shall be glad to answer them.

Mr. ROGERS of Florida (presiding). Thank you very much, Mr. Cox, for your statement. I will ask Mr. Nelsen if he has any questions.

Mr. NELSEN. No questions.

Mr. ROGERS of Florida. Mr. Dominick?

Mr. DOMINICK. No questions.

Mr. ROGERS of Florida. I think it is encouraging to the committee to find that you are making progress in cutting down the damage from accidents. The figures you give us are very encouraging. I may have just a few questions that I would like to ask.

First of all, can you give us an idea—maybe you do not have the figures offhand—as to the number of vehicles controlled by the Interstate Commerce Commission that fall under your jurisdiction?

Mr. Cox. Yes; that figure appears in the latest annual report of the Commission at page 134.

The total number of vehicles—this is based, of course, upon an estimate—is 1,714,556 operated by 132,851 different motor carriers.

Mr. ROGERS of Florida. What personnel do you have that actually devote their time to the question of safety?

Mr. Cox. We have 80 field offices.

Mr. ROGERS of Florida. How many?

Mr. Cox. 80. There are employed 101 safety inspectors whose time is devoted substantially entirely to safety matters. There are also 123 district supervisors who devote varying portions of their time—one-third, approximately—to safety matters.

There are 13 district directors, 2 assistant directors, and 13 rate agents. That is a total of 252.

These latter 28 devote a very small portion of their time to safety. Mr. Qualls points out that here in the Washington headquarters we have 43 people dealing with safety matters, including receiving field staff reports, evaluating them, analyzing accidents, preparing reports for publication and in the development of regulations, considering proposals for regulations, consulting with the people who are affected by and interested in the regulations and the like.

Mr. ROGERS of Florida. Do you have any personnel, who are devoting their time to research in this field? If so, how many?

Mr. Cox. Unfortunately, no. We have on our staff here two mechanical engineers. We did take the time of one of those men for a portion, a major portion, of 1959, and also a portion of 1960, in connection with the brake study which I described, being carried on for us by the Bureau of Public Roads.

Mr. ROGERS of Florida. In other words, you have no research program?

Mr. Cox. We have no facilities and no arrangements for research, although I would like to emphasize that there is a need for it.

Mr. ROGERS of Florida. How do you decide on a change in design?

Mr. Cox. We consult very extensively with technical sources, particularly those maintained by the associations of motor carriers who are subject to regulation, and those technicians available to us through the automobile manufacturers associations. We consult extensively with engineers in the Bureau of Public Roads. We also draw heavily upon the advice of specific manufacturers of components and groups of such manufacturers of components, but in the last analysis, after taking into account, all of the views of these people, it boils down to a determination on the part of our own staff and our representations to the Commission as to the propriety, the reasonableness, and the need for these changes.

Mr. ROGERS of Florida. Have you met much opposition from the manufacturers when you have selected a certain device to be included or certain suggestions as to vehicle design?

Mr. Cox. Ordinarily, sir, we have had what I can properly describe as substantial cooperative assistance from them. They, at times, do take issue with specific proposals we have under discussion, but in the main I think it is fair to say that they have been decidedly cooperative and have been very willing to supply us with the data and information to enable us to arrive at a proper judgment.

Mr. ROGERS of Florida. You feel probably it would be helpful to you if you had some research staff working specifically in this field?

Mr. Cox. I think it would be very helpful, not only in the field of the vehicle and its design, but also in the field of human engineering. Basically, sir, one of the tremendous problems we must cope with and recognize as a fact is that we are responsible for driver qualification standards, driver background standards, and we ought to know more about the effect of physical and mental conditions and fatigue, use of drugs, etc., to guide us in this work.

Mr. ROGERS of Florida. Have you had much difficulty getting information on driver permits?

Mr. Cox. By this you mean driver licenses?

Mr. ROGERS of Florida. I was thinking, perhaps when the driver himself applies—

Mr. Cox. You mean the operator?

Mr. ROGERS of Florida. Applies for his permit, gives false information—have you had any opportunity to make a study of that, or is that a problem?

Mr. Cox. In some of our published reports we have emphasized the unsatisfactory background of drivers who have been involved in accidents, but I cannot say affirmatively to you that we have encountered many cases of falsification or improper use of a license. We did give quite a good deal of emphasis to that involving the operator of an exempt commodity vehicle that collided with a firetruck in Hyattsville, Md., a few years ago. This man was operating under a stolen license. But in terms of the total problem, there is much to be desired with respect to the methods of evaluating background and the selection of drivers. Yet, I cannot say to you that we have had much experience with respect to falsification or the stealing of licenses.

Mr. ROGERS of Florida. I was wondering if you required an applicant to sign a statement as to his experience or submit to physical examination in order to be licensed.

Mr. Cox. No, sir. The licensing is a State function. The Commission does not license anyone, other than authorizing the carrier to perform service.

The issuance of the license to the individual to drive is in the hands of the States. The carrier must see that the driver complies with our rules.

Mr. ROGERS of Florida. Yes, I realize that, but here is what I was concerned about. It seems to me that you might give it some thought. Here you provide the license for a company to operate interstate, do you not?

Mr. Cox. That is true only with respect to the carriers who perform service for hire, and not even all of them require a certificate. Of approximately 132,000 carriers we know of or believe are in operation, less than 19,000 require a certificate or a permit from the Commission. The others are private carriers of property who may go anywhere with anything at any time—except as a carrier for hire—and others are transporters of so-called exempt commodities which need no certificate.

Mr. ROGERS of Florida. You have the authority to check on the safety of their vehicle?

Mr. Cox. Yes, sir, and we do.

Mr. ROGERS of Florida. So far as they are in interstate work?

Mr. Cox. Yes, that is true.

Mr. ROGERS of Florida. That is a factor. Yet, I presume it is one of the greatest factors that will influence safety work, that is, it would be the driver himself, the operator.

Mr. Cox. That is true.

Mr. ROGERS of Florida. I will not say that we make no attempt, but we have no procedure to check an applicant's background or medical history, so far as I can determine.

Mr. Cox. May I say again what is in my statement, sir? We do require the carrier to do this. Under the Commission's regulations, a person may not drive in interstate commerce without obtaining a medical certificate from a licensed doctor of medicine or osteopathy, having the certificate with him while he is driving, and having a copy on file with his employer, even though he himself may be the carrier. Such a certificate must be not more than 3 years old.

Furthermore, the carrier is required by our regulations to examine the driver's background, how often he has been arrested, what crimes he has been convicted of, and particularly to examine his record of traffic arrests and his accident record. So I think, sir, that regulationwise we have provided for this as to the interstate carriers.

Mr. ROGERS of Florida. Do you feel that the Interstate Commerce Commission would have authority to require an operating certificate if you so desired?

Mr. Cox. Yes, I believe that the basic legislation is broad enough.

Mr. ROGERS of Florida. And it gives you that authority?

Mr. Cox. I think so.

Mr. ROGERS of Florida. I refer you to page 6 of your statement. What about the company you mentioned there that could not get rid of a driver because of a union contract? What was the outcome of that case?

Mr. Cox. The Commission published a report on the accident, stating its position as to the carrier's obligation to see that its drivers are qualified as required by regulation.

The Commission also instituted an enforcement action in court against not only the driver who was driving the vehicle when it left the highway, but also the codriver—they are both named in the report. Both of them pleaded guilty to violations of the Interstate Commerce Commission regulations, and each was fined \$150 in Federal court at Council Bluffs, Iowa.

In addition, there has been a tremendous amount of interest in this particular report from management, from labor unions, and we have done everything we can to emphasize this expression on the part of the Commission.

Mr. ROGERS of Florida. Let me ask you one last question: Can the Commission do something about this air pollution problem of buses and trucks? Have you gone into that problem at all? It seems to me that it is building up very rapidly as one of our major problems, so far as air pollution is concerned, according to reports from California and from many of our cities.

Of course, as we urbanize, it becomes a more important problem. I personally find it obnoxious to get behind one of these big trucks. Every time they move out, you are covered with a cloud of smoke com-

ing out of their exhaust pipes. I would hope that the Commission would do something to help this problem.

Mr. Cox. I should like to be careful in making this response, to be sure that my intent is not misunderstood. In the past, we have construed the Commission's responsibility as directing it to impose regulations with respect to safety. There always have been a lack of clear distinction between safety and nuisance in this area. This is not, in any sense, minimizing the importance of your statement. But I also should like to say that because of the absence of well established and documented technical information in this field, and also because we have been so deeply concerned with other safety matters that we believe demand a higher degree of priority, we have not looked into this problem.

I wish to be cautious and not to commit the Commission to a course of action. I think there is a question as to our legal authority here, but I can certainly, and shall be glad (and I am sure in this statement Director Qualls and Mr. Hardin will join with me), to bring your observation to the attention of the Commission and to seek an instruction from them.

Mr. ROGERS of Florida. I think it would be helpful for you to do that, and to let the committee have a written statement as to whether you have a stand in the field, from the health and safety standpoint, and you could perhaps coordinate it between some of the other agencies that are working on the problem. You might find that you have sufficient authority. If not, I think that the committee would like to know of it, because we are very much interested in that field.

Mr. Cox. This is an area, of course, in which the full question of research is tremendously important. And, to the extent we have had an interest in it, we have been awaiting the development of more factual information.

(The information referred to follows:)

INTERSTATE COMMERCE COMMISSION,
OFFICE OF THE CHAIRMAN,
Washington, D.C., May 29, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR CHAIRMAN ROBERTS: On April 18, 1961, Mr. Ernest Cox, Chief of the Section of Safety of the Bureau of Motor Carriers, appeared before your subcommittee to discuss, generally, the motor carrier safety activities of the Interstate Commerce Commission. During the course of his testimony, Mr. Cox was asked whether, under the present statutes, the Commission is authorized to require that motor vehicles, subject to its safety jurisdiction, use devices that would eliminate or reduce the air pollution caused by fumes and other substances discharged from such vehicles. Mr. Cox suggested that he would prefer to submit this question to the Commission for consideration and for a subsequent expression of the Commission's views with respect thereto. This matter has been considered by the Commission, and I am authorized to make the following comments in its behalf:

Except for authority conferred by the Transportation of Explosives Act, the Commission's safety jurisdiction over motor vehicles operated in interstate or foreign commerce is derived from section 204(a) of the Interstate Commerce Act. Under this section it is the duty of the Commission to regulate motor common and contract carriers, and to that end the Commission may establish reasonable requirements with respect to qualifications and maximum hours of service of employees as well as safety of operation and equipment. The Commission is also authorized therein to establish for private motor carriers of property, if need therefor is found, reasonable requirements to promote safety

of operation, and in connection therewith to prescribe qualifications and maximum hours of service of employees and standards of equipment. It has recently been held in *United States v. Pacific Power Company*, U.S. District Court for the District of Oregon, that the Commission's authority to regulate private motor carriers extended only to maximum hours of service of employees and standards of equipment, and not to safety of operations. Nevertheless, since the question of eliminating air pollution involves standards of equipment, the Commission's authority would be the same for all three groups of carriers.

In view of the Commission's authority under section 204(a) to establish "reasonable requirements" with respect to "safety of operation and equipment," we are of the opinion that the Commission is empowered to require that motor vehicles subject to its safety jurisdiction be equipped with devices to eliminate or reduce air pollution resulting from emissions of the exhaust or crankcase. Moreover, we are also of the view that, although the principal thrust of the safety regulations heretofore prescribed by the Commission has been directed toward the prevention of injury to persons or property on or near the highways, the Commission's authority is not so restricted, but extends to the protection of persons and property substantially beyond the highway.

However, in order to prescribe a protective device under the authority of section 204(a), it would be necessary for the Commission to institute a proceeding to determine the reasonableness of the requirement; that is, whether it is reasonably related to the promotion of the health and safety of persons, or the safety of property, and reasonably adapted to the accomplishment of that end. For example, it is not very meaningful to say that a substance is poisonous unless the amount required to produce toxic effects and the form of ingestion are specified. A third question of fact for determination is whether the safety devices are needed only in certain densely populated areas having a large amount of motor vehicle traffic, accompanied by certain geographic and climatic conditions, or whether they are needed throughout the country on the theory that harm is being done in all areas, even though it is not generally known.

In this connection, the Air Pollution Division of the Department of Health, Education, and Welfare and the Motor Vehicle Air Control Board of the State of California are presently conducting extensive research into the questions of whether the discharge of fumes and gases from motor vehicles do, in fact, substantially affect the health or safety of persons or property and whether there now exists, or can be devised, practicable devices which will reduce or eliminate such emissions. We are informed that few definite conclusions have been reached at this time. It is understood, however, that the California Board has required, beginning in 1962, that all vehicles offered for sale in California shall be equipped with approved devices to eliminate pollution caused by substances discharged through the crankcase. It is further understood that the California Board has not prescribed any device to eliminate exhaust discharges, which, to our knowledge, are the principal source of air pollution by motor vehicles, because an efficient and economical one has not as yet been developed.

We are also informed that in 1960, and again in 1961, the Department of Health, Education, and Welfare requested automobile manufacturers to install a device that destroys crankcase fumes on all new cars. To our knowledge there was no additional request for the installation of devices to eliminate exhaust fumes. This would seem to confirm that no such practicable device is available.

The testimony being received by the subcommittee together with the results of the research being conducted by the Air Pollution Division of the Department of Health, Education, and Welfare and the California Motor Vehicle Air Control Board will, when made available, probably provide more definite answers to the questions hereinabove raised. We are of the opinion, therefore, that an investigation by this Commission at this time would serve only to duplicate substantially those investigations already undertaken. Moreover, in view of the small percentage of registered motor vehicles subject to the Commission's safety jurisdiction, approximately 1.7 million out of a total of approximately 70.4 million, we feel that the imposition of safety devices to combat air pollution, if found to be desirable and practicable, should be prescribed by the Congress which has authority to require such devices on all motor vehicles sold in interstate commerce.

Respectfully submitted.

EVERETT HUTCHINSON, *Chairman.*

Mr. ROGERS of Florida. Mr. Dominick, do you have any questions?

Mr. DOMINICK. This is a most important point. It is true, is it not, that at the present time some States have regulations on buses and trucks as to the placement of their exhausts? And secondly, devices which would eliminate air pollution from the exhausts? Some States already have that. It would seem to me that the Commission could certainly coordinate that information and determine whether it is effective, whether it is worthwhile to try to have some requirement of this type.

Mr. Cox. May I respond?

The Interstate Commerce Commission in its safety regulations, for many years has had and still has a requirement with respect to the location of the exhaust. It must be at a location behind the occupants of a bus. It must either be above the cab of a truck or behind the compartment in which the driver rides. We have that definite regulation.

It is for the protection of the passengers and the occupants of the vehicles.

Mr. DOMINICK. Thank you. That is all.

Mr. ROBERTS (presiding). Do you think the Commission at the present time would have the authority to require that devices be placed on the trucks for that purpose, or the blowby device which is being required on passenger cars, that it should be required on trucks and buses?

Mr. Cox. You are speaking now about function and location of the exhaust as the discharge therefrom will affect other users of the highways?

Mr. ROBERTS. Yes.

Mr. Cox. Rather than the occupants?

Mr. ROBERTS. That is right. Would you want to supply that information for the record?

Mr. Cox. I think I ought to reserve a reply on that. Director Qualls and Mr. Hardin concur in my statement that this is a matter that we ought to make inquiry about, and to obtain a Commission instruction on.

Mr. ROBERTS. I missed some of your testimony, I am sorry, but I have been concerned with the fact that many of the States have not adopted a part of the uniform traffic code which requires a physical examination for relicensing of drivers. Do you believe that the Commission would have the authority to require that all operators in interstate commerce must have a physical examination, where they are licensed by the States; that is, before they can be relicensed, which have adopted the Uniform Motor Vehicle Code provision as to the physical examination?

Mr. Cox. In reply to that may I say, first that the Commission's safety regulations for several years have required a physical examination. They specify the standards of physical qualifications. They require an examination by a licensed doctor of medicine or osteopathy before the driver goes to work as an interstate commercial driver. The examination must be repeated at intervals of not more than 3 years.

This requirement is in effect and has been for some years. The requirement extends to those drivers who drive in interstate or foreign commerce.

Unless I have misunderstood your question, I believe that is the extent of our legal ability in this field.

Mr. ROBERTS. Does that mean by any private physician?

Mr. Cox. That is true—a licensed doctor of medicine or osteopathy.

Mr. ROBERTS. You say that it is a requirement that must be met every 3 years?

Mr. Cox. Yes, sir. The Interstate Commerce Commission does not license any person to drive a vehicle. The States do that. The Commission issues certificates, or permits, to authorize motor carriers to operate a transportation business when they transport for compensation in interstate or foreign business. However, with respect to more than 100,000 businesses which operate trucks in interstate service, no certificates or permits are required. Such firms are private carriers or carriers of so-called "exempt" commodities (livestock, fish, and agricultural commodities). Their operations are subject to the Commission's safety jurisdiction but not subject to its economic regulation.

The Commission requires in its regulations that any driver, whether he is working for a carrier licensed by the Commission or for a carrier not requiring a license by the Commission, to be examined physically and to have in his possession a certificate, signed by a doctor, that must not be more than 3 years old.

Mr. ROBERTS. Even if he holds a license from the State, which does not require a physical examination—if he holds a license there under his grandfather rights, and he has been driving for some time, and he has been renewing that license every 2 or 3 years?

Mr. Cox. This is true. Speaking now of the driver, let us assume that the driver has been licensed by a particular State to drive, even though he has lost a leg or has lost the sight of one eye. This is not uncommon. Even though he has been so licensed, he may not drive in interstate commerce unless he has sight in both eyes of a specified degree, and unless he has not suffered the loss of a hand, a foot, a leg, or an arm, and has been examined by a licensed doctor of medicine or osteopathy. If he has not, he may not drive in interstate commerce, regardless of what the State in which he is a resident permits him to do.

Mr. ROBERTS. Here is another subject having to do with the vehicle. How frequently do you conduct inspections of the equipment?

Mr. Cox. This varies a great deal with respect to carriers and localities. I said in my statement that we have for years paid particular emphasis to carriers whose vehicles transport explosives, flammables, compressed gases, poisons, radioactive materials, and other dangerous items.

Mr. ROBERTS. What is it with respect to braking systems?

Mr. Cox. We make inspections—carefully detailed inspections—of about 60,000 vehicles a year on a spot check basis. We do not have a prescribed schedule as to how often we will see the vehicle, say of carrier X. It depends on where he is, how far it is from our location, but in the course of time we encounter a very sizable sample of these vehicles.

Mr. ROBERTS. What percent of the total number of vehicles upon the roads are there of those 60,000 at the present time that cannot pass?

Mr. Cox. A very small percentage. Director Qualls will compute this.

Mr. QUALLS. I will have to have a slide rule for this. It is about three-hundredths of a percent, but do not hold me to that as being exactly correct.

Mr. Cox. May I add to that reply? The fact is that the fundamental basis upon which our regulations are based is that we regulate the carrier. We require the carrier to establish an adequate inspection and maintenance system and to keep records with respect to it. It is inconceivable that we, with our small staff, could undertake to do the inspection ourselves on any basis that would be really adequate in relation to the usage that these vehicles get.

Mr. ROBERTS. In other words, if you allow the safety record to get into jeopardy, so far as the Commission is concerned, you do not grant the carrier new licenses?

Mr. Cox. That is true, but only with respect to a portion of the carriers for whom we have responsibility. Of the 132,000 carriers, less than 19,000 are required to have a license from the Commission. We must supervise and spot check the balance. And if they violate our regulations, we must take them into court.

It is a fact there are some of these of whom we have no record, but we continue to identify them and serve them with the regulations.

Mr. ROBERTS. Is all of this inspection work carried out by the Motor Carrier Bureau, or carried out in the Bureau of Motor Carriers? Or do you have a separate department?

Mr. Cox. It is carried out in the Bureau of Motor Carriers.

Mr. ROBERTS. How many people do you have in that Bureau?

Mr. Cox. In the field offices there are a total of 252 men. These are distributed throughout 80 field offices. Director Qualls can answer that more specifically.

Mr. QUALLS. We have a total of 524 employees in the Bureau; 102 of them are in Washington and 420 of them in the field staff. This includes clerical personnel.

Mr. ROBERTS. That is pretty thin.

Mr. QUALLS. That is right. We have 80 offices, and in many of the States we only have 1 office in the State, and we may have 3 people there. The supervisor, a safety inspector, a clerk, and so forth. Of course, in some States we have more than one office.

Mr. ROBERTS. It would appear to me that you could use additional personnel.

Mr. QUALLS. Yes, sir, we could do a better job, of course, with additional people. We have not been doing too good a job with the migrant workers. We got into that question of the transportation of migrant workers rather late.

Mr. ROBERTS. What type of vehicles are represented there?

Mr. QUALLS. I have no idea how many there are there. Do you have any idea?

Mr. Cox. This would be a wild guess.

Mr. QUALLS. We have not been able to find all of them yet.

Mr. ROBERTS. That is all. Thank you.

Mr. Cox. Thank you.

Mr. ROBERTS. In connection with the testimony regarding the responsibility of the Interstate Commerce Commission for the promotion of safety, a press release dated February 8, 1961, and two letters

addressed to me, one under the date of August 30, 1960, and the other dated September 27, 1960, will be of interest.

These are as follows:

INTERSTATE COMMERCE COMMISSION,
Washington, D.C., February 8, 1961.

CHANGE IN MOTOR CARRIER FITNESS LAW SOUGHT BY ICC IN 74TH ANNUAL
REPORT; CARRIER REVENUES REACH RECORD HIGH

The Interstate Commerce Commission asked Congress today for authority to deny, revoke or suspend motor carrier operating rights if used in the commission of a felony or if perjury is committed in applying for the rights and conviction of the crime affects the fitness of the carrier.

In its 74th annual report to Congress, the Commission said it does not believe it should be the "keeper of the morals" of the transportation industry but should lend its weight to efforts to stamp out crime wherever it arises. The ICC added, however, that its efforts "must be relevant to the conduct of the transportation business."

As part of its program to expedite disposition of cases and to free the Commissioners from the burden of considering the thousands of cases of a relatively routine nature, the report renewed a recommendation for authority to delegate additional work to staff employees. Under the proposal the Commission would delegate to employee boards for decision all proceedings cases except those of general transportation importance. At present only those cases of minor importance that have not been the subject of a hearing may be delegated to employee boards.

Chairman Everett Hutchinson stressed the importance of the amendments relating to motor carrier fitness and delegation of additional decisional authority to staff boards and expressed hope for early consideration and enactment of these proposals.

"The report's legislative recommendations were drafted after lengthy study in an effort to provide more equitable and efficient regulation of interstate transportation and to improve internal organization of the Commission," the Chairman said.

Six of the 14 proposals were new; 8 were renewed from previous annual reports.

One new recommendation would make more definite the Commission's authority to regulate the safety of operations of private motor carriers of property—trucking operations of business firms not conducted for hire but privately for the companies themselves. The Commission's authority in this field was conferred by Congress initially under the Motor Carrier Act, in 1935, but was limited recently by a court ruling.

Other new legislative recommendations presented in the report would—

Made common carriers by motor vehicle and freight forwarders liable for payment of damages in reparation awards;

Authorize voluntary establishment of through routes and joint rates between motor and water common carriers subject to the Interstate Commerce Act, and common carriers subject to jurisdiction of the Federal Maritime Board on traffic between Alaska or Hawaii and the other States;

Eliminate the mandatory requirement that certain reports, applications, and complaints be filed under oath;

Provide protection against assault for certain ICC personnel engaged in their official duties, such as is afforded other Federal personnel engaged in investigatory and enforcement matters.

An earlier legislative recommendation renewed in the 1960 annual report would permit prescription of railroad freight car per diem rates which would provide an economic incentive to carriers to maintain an adequate supply of cars.

Another earlier recommendation would amend as obsolete those provisions of the Railway Mail Service Pay Act directing the Postmaster General to request from the Commission information as to revenues received by the railroads from railway express and the rates, as ascertained, for the transportation of express matter.

The eight carrier groups subject to the Commission's jurisdiction had record high revenues of \$19.53 billion for the 12 months ended June 30, 1960, which compared with \$19.4 billion for the previous 12 months. This gain was more than offset, however, by rising costs, the report stated.

Railroad income continued to account for the largest portion of total operating revenues, amounting to over \$10 billion. This was a decrease, however, from the previous 12 months' rail revenues. Water carrier revenues also declined. Motor carriers of property revenues reached a record high of \$7.3 billion, more than one-half billion dollars above the previous year's amount. Motor carriers of passengers and oil pipelines also registered gains in revenues compared to the previous 12-month period.

Operating revenues in the comparable years for the carrier groups regulated by the ICC follow:

[In thousands]

	Fiscal year 1960	Fiscal year 1959
Railroads.....	\$10,064,085	\$10,434,281
Railway Express.....	244,668	255,881
Pullman Co.....	57,324	62,176
Electric railways.....	24,163	29,814
Waterlines.....	405,699	453,353
Pipelines (oil).....	769,441	760,076
Motor carriers of passengers.....	647,143	604,296
Motor carriers of property.....	7,317,594	6,810,962
Total.....	19,530,117	19,410,939

Intercity ton-miles of all agencies of transportation were higher in calendar 1959 than in 1958. The 1959 total of 1,312 billion ton-miles compared with 1,215 billion in 1958 and the high record of 1,360 billion in 1956.

The railroads' share in the ton-mile total was down to 45.44 percent in 1959 compared with 45.98 percent in 1958. The share of motor transportation of property was 21.98 percent compared with 21.03 in 1958. Carriers on the inland waterways and Great Lakes had 15.24 percent of the total, a decrease from the 15.55 percent of 1958. The oil pipelines' share declined slightly from 17.39 percent in 1958 to 17.29 percent in 1959. The airways recorded 0.0492 percent of the total in 1959, compared with 0.0476 in 1958.

The private automobile continued to transport the major share of intercity passengers, recording 89.53 percent of the total intercity passenger-miles for calendar 1959. This compared with 89.36 percent for the previous year. The airways' percentage for 1959 was 4.39, a gain from the 4.05 of 1958. The railroads' share dropped from 3.35 to 3.04 percent in 1959. Motor carriers of passengers declined to 2.76 from the 2.95 percent a year earlier. Inland waterways' passenger-miles decreased from 0.29 percent in 1958 to 0.28 in 1959.

In the Commission's railroad safety appliance inspection program 1.7 million units were inspected in fiscal year 1960, a 35-percent increase compared with fiscal 1959.

In the field of motor carrier safety, 61,000 vehicles were inspected in fiscal year 1960. The number of vehicles found to be unserviceable decreased 2.2 percent compared with the previous year.

The 74th annual report of the commission may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

INTERSTATE COMMERCE COMMISSION,

Washington, August 30, 1960.

HON. KENNETH A. ROBERTS,

Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR CONGRESSMAN ROBERTS: Chairman Winchell requested me to reply to your letter of August 22, as stated in his acknowledgment of August 23. You refer to evidences of serious deficiencies in commercial driver training and licensing programs. You have offered suggestions designed to strengthen our rules and ask for our reaction.

It is true that many traffic accidents involving interstate commercial vehicles have resulted from the use of drivers who were incompetent, had bad traffic arrest records, were fatigued, or had used drugs as stimulants. In a number of cases a combination of these factors existed.

You may be interested in some of the accident investigation reports we have published as a means of educating and stimulating motor carriers to adopt better procedures and controls as to driver selection and supervision. I en-

close a few of these reports in which the factors you mention appeared as major causes. Reports 9 and 37 are examples of the use of amphetamine drugs to offset excessive hours of duty. Reports 18, 22, 24, 36, and 38 illustrate cases in which the commercial drivers responsible were seriously fatigued, were incompetent, or had had accident, arrest, or suspension records.

In administering its responsibility for motor carrier safety under provisions of section 204 of the Interstate Commerce Act, the Commission has adopted regulations prescribing minimum driver qualification standards. These standards include physical, experience, and traffic arrest provisions. I enclose a copy of them, published in part 191 of our safety regulations (49 C.F.R. part 191).

Responding to the question in the fourth paragraph of your letter, I believe that our present physical fitness requirements basically are adequate. They are stated in section 191.2. They contain specific standards as to eyesight and hearing ability. They prescribe no amputation of foot, leg, hand, or arm. They provide that drivers shall not have diseases or impairment of extremities likely to interfere with safe driving. These are minimum requirements, as stated in section 191.2, and as emphasized in section 191.12, shown on sheet 7 of the enclosure.

To require management diligence in the matter of recruitment and subsequent supervision of drivers we have prescribed section 191.13. This places responsibility on the carrier to observe the qualification standards. There are serious problems in defining qualification standards related to the number and types of offenses for which a driver has been convicted. There are differences among the States as to the classification of serious traffic offenses and we believe that great care must be exercised in adopting a regulation which can result in disqualifying a man from pursuing his livelihood. Another basis for concern is the possibility that the adoption of a prescribed standard by Government regulation may result in labor union pressure to prevent management from exercising discretion with respect to drivers who may be unsuitable but who would not be disqualified under a Government standard.

The Commission has not considered adoption of a regulation which would require a commercial driver to furnish his driving history on a prescribed form. It does, however, require carriers to ascertain and to retain a record of all driver acts, violations, and offenses which demonstrate fitness or lack of it. This requirement, stated in section 191.13, applies both in the employment and the subsequent use of drivers.

We have pursued a policy of vigorous enforcement with respect to our present safety regulations. There has been substantial disregard of the hours of service limitations. There is now pending a proposed revision of our hours of service regulations, including a proposal to authorize our staff to remove from service drivers found to be working in excess of our prescribed maximum limits. There have been substantial industry and labor union opposition. Hearings have been held and the examiner has fixed a date for the filing of briefs.

I assure you of our deep concern with respect to the matters you have discussed. If you believe a conference with officials of our Bureau of Motor Carriers will be helpful, I shall be glad to arrange it at your convenience.

Sincerely yours,

RUPERT L. MURPHY, *Chairman, Division 1.*

INTERSTATE COMMERCE COMMISSION,
Washington, D.C.

MOTOR CARRIER SAFETY REGULATIONS—REVISION OF 1952

(49 Code of Federal Regulations—Part 190-196)

PART 191. QUALIFICATIONS OF DRIVERS

Section 191.1. *Compliance required.* Every motor carrier, and his or its officers, agents, representatives, and employees who drive motor vehicles or are responsible for the hiring, supervision, training, assignment, or dispatching of drivers shall comply and be conversant with the requirements of this part.

Section 191.2. *Minimum requirements.* No person shall drive, nor shall any motor carrier require or permit any person to drive any motor vehicle unless such person possesses the following minimum qualifications:

(a) *Mental and physical condition:*

(1) No loss of foot, leg, hand or arm;

(2) No mental, nervous, organic, or functional disease, likely to interfere with safe driving;

(3) No loss of fingers, impairment of use of foot, leg, fingers, hand or arm, or other structural defect or limitation, likely to interfere with safe driving.

(b) *Eyesight.* Visual acuity of at least 20/40 (Snellen) in each eye either without glasses or by correction with glasses; form field of vision in the horizontal meridian shall not be less than a total of 140 degrees; ability to distinguish colors red, green, and yellow; drivers requiring correction by glasses shall wear properly-prescribed glasses at all times when driving provided, however, that until January 1, 1954, a visual acuity, either without glasses or by correction with glasses, of at least 20/40 in one eye and 20/100 in the other eye will be acceptable under this Section with respect to any person working as a driver on the effective date of this Section or who was working as a driver at any time within six months prior to such effective date.

(c) *Hearing.* Hearing shall not be less than 10/20 in the better ear, for conversational tones, without a hearing aid.

(d) *Liquor, narcotics, and drugs.* Shall not be addicted to the use of narcotics or habit-forming drugs, or the excessive use of alcoholic beverages or liquors.

Section 191.3. *Driving Experience.* Every driver shall be experienced in driving some type of motor vehicle (including private automobiles) for not less than one year, including experience throughout the four seasons.

Section 191.4. *Driving Skill:* Every driver shall be competent by reason of experience or training to operate safely the type of motor vehicle or motor vehicles which he drives.

Section 191.5. *Knowledge of Regulations:* Every driver shall be familiar with the rules and regulations established by the Commission pertaining to the driving of motor vehicles.

Section 191.6. *Age:* Every driver shall be not less than 21 years of age, provided, however, that a person not less than 18 years of age may be permitted to drive a motor vehicle controlled and operated by any farmer and used in the transportation of agricultural commodities and products thereof from his farm or in the transportation of supplies to his farm, if such vehicle does not exceed a gross weight, including the load, of 10,000 pounds.

Section 191.7. *Knowledge of English:* Every driver shall be able to read and speak the English language.

Section 191.9. *Original Physical Examination of Drivers:* No person shall drive nor shall any motor carrier require or permit any person to drive any motor vehicle unless such person shall have been physically examined and shall have been certified by a licensed doctor of medicine or osteopathy as meeting the requirements of Section 191.2, except that a motor carrier may continue to use as a driver until January 1, 1954, any person for whom it has on file a valid certificate of physical examination or who was qualified as a driver without such examination under the regulations of the Commission in effect immediately prior to the effective date of this Section; Provided, however, that this Section shall not apply to drivers of motor vehicles controlled and operated by any farmer when used in the transportation of agricultural commodities or products thereof from his farm, or in the transportation of supplies to his farm.

Section 191.9. *Periodic Physical Examination of Drivers:* On and after January 1, 1954, every driver shall be physically re-examined at least once in every 36 months and no person shall drive nor shall any motor carrier require or permit any person to drive any motor vehicle unless such person shall have been physically examined and certified by a licensed doctor of medicine or osteopathy as meeting the requirements of Section 191.2; Provided, however, that this Section shall not apply to drivers of motor vehicles controlled and operated by any farmer when used in the transportation of agricultural commodities or products thereof from his farm, or in the transportation of supplies to his farm.

Section 191.10. *Certificate of Physical Examination:* If a physical examination is required by Sections 191.8 or 191.9, every motor carrier shall have in its files at its principal place of business for every driver employed or used by it a legible certificate of a licensed doctor of medicine or osteopathy, based on a physical examination as required by Sections 191.8 and 191.9 or a legible photographically reproduced copy thereof, and every such driver, if a physical exami-

nation is required with respect to him by Sections 191.8 and 191.9, shall have in his possession, while driving, such a certificate or a photographically reproduced copy thereof covering himself.

Section 191.11. *Doctor's Certificate*: The doctor's certificate shall certify as follows:

DOCTOR'S CERTIFICATE

This is to certify that I have this day examined _____ in accordance with Section 191.2, and the physical examination procedure prescribed by the Motor Carrier Safety Regulations, Revision of 1952, of the Interstate Commerce Commission, and that I find him

Qualified under said rules _____

Qualified only when wearing glasses _____

I have kept on file in my office a completed examination form for this person

(Date)

(Place)

(Signature of examining doctor)

(Address of doctor)

Signature of driver _____

Address of driver _____

Such certificate shall be based on a physical examination made and recorded generally in accordance with the following instructions and examination form.

GENERAL INSTRUCTIONS FOR MAKING PHYSICAL EXAMINATION AND RECORDING FINDINGS

(Be sure to record an answer in each question. When negative or positive so state.)

MEDICAL HISTORY

The purpose of this physical examination is to detect the presence of physical and mental defects of such a character and extent as to affect the applicant's ability to operate safely a motor vehicle. The examination should be made carefully and at least as complete as is indicated by the attached form. Defects may be recorded which do not, because of their character or degree, indicate that a certificate of physical fitness should be denied. The presence, however, of these defects should be discussed with the applicant and he should be encouraged to take the necessary steps to insure correction particularly of those which if neglected might lead to a condition likely to affect his ability to drive safely. Careful inquiry regarding past illness, the character and date of such illness, may reveal cause for defects found upon physical examination. Lack of knowledge concerning the etiology of certain defects may result in the rejection for employment. Such data also may indicate the need for making certain laboratory tests.

General appearance and development.—Note marked underweight or overweight; any posture defects; perceptible limp, anemia, tremor or other form of nervousness such as might be caused by chronic alcoholism, thyroid intoxication, or other illness. The regulations of the Interstate Commerce Commission provide that no driver shall be addicted to the use of narcotics or habit-forming drugs, or the excessive use of alcoholic liquors or beverages.

Head-Eyes: The telebinocular, Snellen chart, other approved tests may be used to measure visual acuity. It is desired, however, when other than the Snellen chart is used, that the results of such test be expressed in values comparable to the standard Snellen test. If applicant wears glasses, these should be worn while applicant's visual acuity is being tested. Indicate on record by striking the inapplicable phrase on form "without glasses" or "with glasses if worn." In recording distance vision use 20 feet as normal. Report all vision as a fraction with 20 as numerator and the smallest type read at 20 feet as denominator. Note ptosis, discharge, corneal scar, exophthalmos or strabismus uncorrected by glasses.

Ears: Note evidence of mastoid or middle ear disease; discharge. In recording hearing, record 20 feet as normal distance for conversational voice and record deviation from normal as fraction with 20 feet as denominator and actual distance as numerator.

Mouth: Note evidence of infection, pyorrhea.

Throat: Note evidence of disease, enlarged or infected tonsils.

Thorax-Heart: Stethoscopic examination is required. Note murmurs and arrhythmias. Electro-cardiogram is required when other findings indicate desirability.

Blood Pressure: May be recorded with either spring or mercury column type of sphygmomanometer.

Pulse: Normal pulse taken after being seated at least two minutes, then have applicant stand and placing one foot on the seat of an ordinary chair raise his body to an erect position 20 times in 30 seconds. Pulse rate should return to normal after two minutes' rest. Because of abnormal conditions, some applicants will be unable to do this. This test has been found helpful in ascertaining physical ability for work.

Lungs: It is necessary that the auscultatory cough be used. Tuberculosis, if suspected, state whether active or arrested, and if arrested, your opinion as to how long it has been quiescent. Sputum to be examined for tubercle bacilli in all suspected cases.

Abdomen: Scars: If present, state whether recent and if abnormally tender or if there is any evidence of hernia at the site of scar.

Abnormal masses: If present, note tenderness and whether or not individual knows how long they have been present.

Tenderness: When noted, state where most pronounced and cause suspected.

Hernia: Note whether no hernia, but impulse on coughing; no hernia or impulse, but abnormally large rings. Any hernia should be noted, and if present, state whether it is retained by well-fitted truss.

Genito-Urinary: When scars or urethral discharge are present, indicate patient's reason for same and when indicated, submit smear of discharge to laboratory for examination.

Reflexes: If positive Rhomberg is reported, indicate degree. Pupillary reflexes should be reported for both light and accommodation. Knee jerks are to be reported absent only when not obtainable upon reinforcement and as increased when foot is actually lifted from the floor following light blow upon the patella; otherwise as normal.

Extremities: Be sure to record loss of foot, leg, fingers, hand or arm, or impairment of use thereof, or other structural defect or limitation, likely to interfere with safe driving.

Upper: Note deformities and limitation of motion.

Lower: Note deformities, limitation of motion; varicose veins.

In case of hand deformities, note particularly whether or not sufficient grip is present to enable driver to secure a grip on the wheel. Record chronic ulcers. Note any atrophy or paralysis.

Spine: Note deformities and limitation of motion.

Laboratory Findings: Urine analysis is indicated whenever systolic blood pressure is over 150 and diastolic over 100 and such other times as medical history or findings upon physical examination may indicate that they are necessary. A serological test should always be taken in case of those giving history of luetic infection or present physical findings upon examination presenting possibility of latent syphilis.

Upon completion of the examination, physician should always date and sign his record of the same.

MINIMUM REQUIREMENTS OF SECTION 191.2

- (a) Mental and physical condition ;
- (1) No loss of foot, leg, hand, or arm ;
- (2) No mental, nervous, organic, or functional disease, likely to interfere with safe driving ;
- (3) No loss of fingers, impairment of use of foot, leg, fingers, hand, or arm, or other structural defect or limitation, likely to interfere with safe driving ;
- (b) *Eyesight*: Visual acuity of at least 20/40 (Snellen) in each eye either without glasses or by correction with glasses ; form field of vision in the horizontal meridian shall not be less than a total of 140 degrees ; ability to distinguish colors red, green, and yellow ; drivers requiring correction by glasses shall wear properly prescribed glasses as all times when driving provided, however, that until January 1, 1954, a visual acuity, either without glasses or by correction with glasses of at least 20/40 in one eye and 20/100 in the other eye will be acceptable under this Section with respect to any person employed as a driver on or within six months prior to the effective date of this Section.
- (c) *Hearing*: Hearing shall not be less than 10/20 in the better ear, for conversational tones, without a hearing aid.
- (d) *Liquor, Narcotics, and Drugs*: Shall not be addicted to the use of narcotics or habit-forming drugs, or the excessive use of alcoholic beverages or liquors.

PHYSICAL EXAMINATION OF DRIVERS

Name -----	Date -----		
(Please print)	(Last)	(First)	(Middle)
Present Address -----	-----		
	(Number)	(Street)	
	(City)	(State)	
(Social Security Account No.) -----			
Birth -----	Age -----		
(Month)	(Day)	(Year)	(Place)

HEALTH HISTORY

Yes	No	
-----	-----	Head or spinal injuries (severe)
-----	-----	Convulsions (fits, epilepsy)
-----	-----	Encephalitis (sleeping sickness)
-----	-----	Ever confined as chronic invalid
-----	-----	Heart disease
-----	-----	Tuberculosis
-----	-----	Syphilis
-----	-----	Gonorrhea
-----	-----	Diabetes
-----	-----	Stomach ulcer
-----	-----	Rheumatic fever
-----	-----	Asthma
-----	-----	Kidney disease
-----	-----	Suffering from incurable disease
-----	-----	Permanent defect as result of disease or accident
Other illness or		Injuries -----

PHYSICAL EXAMINATION

General appearance and development:

Good----- Fair----- Poor-----

Height----- Weight-----

Head:

(Without Glasses)

Eyes: For distance-----

Right 20/----- Left 20/-----

(With glasses if worn)

Evidence of disease or injury:

Right----- Left-----

Color vision----- Horizontal field of vision:

Right----- Left-----

Ears: Hearing 20 feet:

Right ear-----/20. Left ear-----/20.

Disease or injury-----

Mouth----- Throat-----

Thorax:

Heart-----

If organic disease is present, is it fully compensated?

Blood pressure (sitting):

Systolic----- Diastolic-----

Pulse: Before exercise-----

Two minutes' rest after exercise-----

Lungs:-----

Abdomen:

Scars----- Abnormal masses-----

Tenderness-----

Hernia: Yes----- No----- If so, where?-----

Is truss worn?-----

Genito-Urinary:

Scars----- Urethral Discharge-----

Reflexes:

Rhombberg-----

Pupillary----- Light R----- L-----

Accommodation R----- L-----

Knee Jerks:

Right: Normal----- Increased----- Absent-----

Left: Normal----- Increased----- Absent-----

Extremities:

Upper-----

Lower-----

Spine-----

Laboratory Findings:

Urine: Sp. Gr.----- Alb.----- Sugar-----

Blood Serology-----

Chest X-ray-----

(Date)

(Examining Doctor)

(Address)

Section 191.12. *Carriers Right to Require Additional Qualifications.* Nothing contained in Parts 190-197 of this subchapter shall be construed as to prevent a motor carrier from requiring additional or more stringent physical, mental, or intellectual qualifications or age requirements than prescribed in this part as minima; or to require more frequent or more stringent physical or mental examinations than prescribed in this part, notwithstanding that a driver may have in his possession a doctor's certificate as herein required.

Section 191.13. *Driver's Past Record:* In addition to the other qualifications required by this part, motor carriers shall in the employment and use of drivers and from time to time thereafter in continuing drivers in their service give due consideration to the following factors where they exist:

(a) Violations of laws or regulations governing the operation of motor vehicles of which the driver is guilty, especially as to those violations which tend to establish a disregard for regulatory requirements and for the public safety.

(b) The driver's accident record insofar as it tends to establish a lack of concern for or indifference to his own or the public's safety.

(c) Violations of criminal laws of which the driver is guilty, especially with respect to those offenses which tend to demonstrate his unfitness in the public interest to be a driver of a motor vehicle in interstate or foreign commerce.

Motor carriers shall maintain and preserve as part of each driver's personnel record a summary of all driver acts and offenses which are within the purview of this Section. In addition to the periodic review of such records as contemplated by the regulations, motor carriers shall specifically review the individual record of a driver when he is involved in a serious accident to the end that reckless or accident-prone drivers may not continue to drive vehicles as a hazard to the public safety.

INTERSTATE COMMERCE COMMISSION,
Washington, D.C., September 27, 1960.

Hon. KENNETH A. ROBERTS,
U.S. House of Representatives,
Washington, D.C.

MY DEAR CONGRESSMAN ROBERTS: This will respond to your letter of September 19, 1960, regarding the sanctions available to the Commission for enforcing its regulations prescribing vehicle safety standards and asking what action was taken against motor carriers who did not meet such standards.

The motor carrier safety regulations are prescribed by the Commission under the authority delegated to it by section 204(a), paragraphs (1), (2), (3), and (3a) of the Interstate Commerce Act (49 U.S.C. 304).

Failure to comply with the Commission's safety regulations is subject to the penalty provisions of section 222 (49 U.S.C. 322) of the act.

The Commission is empowered under the authority of sections 204(c) and 212(a) to institute proceedings looking toward suspension or revocation of the operating rights held by motor carriers for violation of the safety regulations.

Under the provisions of sections 207 and 209 the Commission may issue certificates or permits to common and contract carriers if it finds the applicant fit, willing and able properly to perform the service. Under section 210a(a) the Commission may, in its discretion, deny applications for temporary operating authority.

During the calendar year 1959, principally as the result of investigations conducted by the Commission's field staff, criminal proceedings were instituted which resulted in 186 motor carrier defendants being prosecuted in the Federal courts for failure to properly equip vehicles as prescribed by part 193 of the safety regulations and for failure to maintain systematic inspection and maintenance records as provided by part 196, and fines totaling \$160,565 were assessed against such defendants. This was in addition to cases based on other safety violations.

In the first 7 months of 1960, 83 defendants were prosecuted and fines totaling \$74,250 assessed. In addition, permanent injunctions were issued against two defendants and one was placed on probation.

From January 1, 1959, through August 1960, 223 applications for temporary authority were denied by the Commission, and 74 were limited in duration, based on the unsatisfactory safety record of the applicants concerned. This is approximately 8 percent of the applications considered.

In recent years, a number of proceedings have been instituted by the Commission under sections 204(c) and 212(a) based on safety violations. Evidence of safety noncompliance has been introduced into the record in many application proceedings. I enclose copies of two reports in which this action resulted in denials of such applications.

In 1959 we enlarged our programs of considering safety matters in application proceedings. A considerable number of such cases are now pending, or are awaiting hearing, on the issue of the fitness question.

I assure you we are deeply conscious of the far-reaching importance of our motor carrier safety work. We intend to administer our responsibility in this field with the maximum possible effectiveness.

Your interest is deeply appreciated.

Sincerely,

RUPERT L. MURPHY,
Chairman, Division 1.

Mr. ROBERTS. The next witness is Mr. Peyton Ford, general counsel for the National Auto & Flat Glass Dealers Association, 1000 Connecticut Avenue, Washington, D.C.

We shall be glad to hear from you now.

STATEMENT OF PEYTON FORD, GENERAL COUNSEL, NATIONAL AUTO & GLASS DEALERS ASSOCIATION; ACCOMPANIED BY E. H. SIESEL, ST. LOUIS, CHAIRMAN, LAMINATED SAFETY GLASS COMMITTEE; HENRY RICHARDSON, DeBELL & RICHARDSON, HAZARDVILLE, CONN.; AND ROBERT BOUCHARD, GLASS DISTRIBUTORS, INC., WASHINGTON, D.C.

Mr. FORD. Mr. Chairman and members of the committee, I am Peyton Ford, general counsel for the National Auto & Flat Glass Dealers Association. I am accompanied by Mr. E. H. Siesel of St. Louis, who is chairman of our laminated safety glass committee; Mr. Henry Richardson of DeBell & Richardson, an engineering consulting firm of Hazardville, Conn.; and Mr. Robert Bouchard of Glass Distributors, Inc., Washington, D.C. They will answer any technical questions you may have.

We are appearing on behalf of the association to urge you to include laminated safety glass in H.R. 903. On March 28, Mr. James R. Turnbull, program director of the laminated safety glass committee of our association, appeared before you and presented our position with regard to the use of laminated safety glass and argument in support thereof. He urged and I again urge that H.R. 903 include a provision which would require motor vehicle manufacturers to use laminated safety glass in all windows forward of seated passengers.

The popular conception of safety glass remains to this day in the minds of most Americans as consisting of two pieces of glass laminated together with a tough layer of plastic. There has been the popular conception of what safety glass is. It is still thought of in terms of laminated glass.

And beginning in 1956, as Mr. Turnbull pointed out, the motorcar manufacturers began a sizable switch, basically for reasons of economy, into tempered glass. So it's our contention that tempered glass is not safety glass in the true sense of the word.

There is testimony before the Federal Trade Commission, in Federal Trade Commission versus Libby-Owens-Ford and General Motors, docket No. 7643, that would establish this completely to the committee's satisfaction. I would respectfully recommend to the committee that they ask the Federal Trade Commission if there has been such an order, or if there has been a consent filed or a compliance report as the result of this case.

Experience has proved and is continuing to prove that tempered glass is far from being safety glass. We have seen hundreds of accident reports involving it. Many people are surprised to find out that they do not have laminated glass when they have assumed that they have it, since this so-called silent switch in 1956.

At page 3 of my statement I cite several letters. I will not burden the committee with reading them.

The Interstate Commerce Commission 25 years ago considered this question, and an examiner made an exhaustive finding that laminated safety glass is still the only safety glass that can be knocked out with your hand, elbow, shoulder or foot. And the Commission adopted that finding, and it is still in effect.

As to this preliminary report in 1958 made by Cornell University, it has been asserted to indicate that tempered glass causes fewer injuries than laminated glass. An examination of this report reveals that it is wholly inadequate. Without going into too great detail, but to summarize this, around 70 million motor vehicles are on the highways of this country and out of that number the experiment involved 715 cars. That, certainly, is not a very scientific research, at least, so far as I am concerned.

In 1958 at the Atlantic City meeting of the Society of Automotive Engineers, Dr. Ryan of Libbey-Owens-Ford made a statement at that meeting. In reading his statement to this committee it appears that he changed his mind. Unfortunately, we have not been able to get a copy of that report of Dr. Ryan's, the one made in 1958.

I would respectfully again suggest to the committee that they request Dr. Ryan to furnish that statement and to compare it against his testimony given on Friday, I believe.

To go back to another statement of Mr. Richards, with relationship to the hearing before the Missouri House of Representatives, the chairwoman of the committee asked, "How many of those cars," speaking again of the Cornell report, "had laminated glass in the side windows?" Mr. Richards, who testified here before you last week, answered the question, "It was a case of both tempered and laminated—but the tempered had fewer lacerations, fewer injuries than the laminated." The chairwoman replied, "Now, Mr. Richards, isn't it a fact that it was the other way?"

That is the way it is.

In connection with that testimony—and I am skipping to another part of my prepared statement—it comes in better here—I would hardly say that they threatened, but they issued veiled statements to the State of Missouri that if they do not maintain uniformity which the association places a good deal higher value on than it does safety, that they might pull out of Missouri. Then also this is one statement that is made on page 5 of the transcript of that hearing. And it reads as follows:

Now this is an introduction, and let me add one other point. In this bill it is provided that any vehicles assembled in the State of Missouri would have to have this type of glazing material. Well now, this is very important to motor vehicle manufacturers because St. Louis in your State has now become the second largest automobile motor vehicle section in the United States and there is the possibility of repercussions on whether vehicles would be assembled in a State that made such a deviation from uniformity or whether the assembly would be in some other State where there wasn't that deviation.

Leaving that, and going back to a statement concerning the $\frac{1}{4}$ -inch thickness of tempered glass, it had to be made that way to be safe at all. It now appears that the manufacturers are thinning down the one-quarter inch. According to the glass industry, the technical manual, glass thinner than one-quarter inch cannot be safety-tempered, and that is a quotation from PPG.

Also, I have a letter that I wish to place in the record. It only came into my possession this morning. It is addressed to Mr. Yudenfriend, who has a statement, too, that I would like to have placed in the record. It is by a representative of Libbey-Owens-Ford.

(The letter dated January 27, 1959, follows:)

LIBBEY-OWENS-FORD GLASS CO.,
Ardmore, Pa., January 27, 1959.

Mr. H. YUDENFRIEND,
Stott-Hecht Glass Works,
Philadelphia, Pa.

DEAR MR. YUDENFRIEND: Ever since we introduced Libbey-Owens-Ford Tuf-flex tempered plate glass as an available product, we have always limited its availability and our manufacturing to basically furnishing one-fourth inch thickness or heavier plate glass processed by the tempering method.

It has been the opinion of both our company and our technical staff that only by using one-fourth inch or heavier glass, can we offer fully tempered Tuf-flex products that will measure up to the trade and users requirements.

Yours very truly,

GEO. E. HILL, Jr., District Manager.

Mr. FORD. I would like now, if the Chairman will indulge me, to have Mr. Siesel explain to you two exhibits we have here.

Mr. SIESEL. Mr. Chairman, this is a piece of tempered glass which is made by PPG. This glass was in stock in one of our dealer's place of business. This glass, while it was not being used in any automobile, exploded to this extent. We want to present it as an exhibit.

Mr. FORD. How did it explode?

Mr. SIESEL. Nothing struck it or anything else—it just merely was setting there and for no reason at all this glass just exploded.

Mr. FORD. Is that tempered glass?

Mr. SIESEL. It is tempered glass.

Mr. ROBERTS. Where did this occur?

Mr. SIESEL. This happened in Chicago, Ill., in the place of the Globe Glass Co.

Mr. ROBERTS. Was it in their stock in the store?

Mr. SIESEL. It was in their stock, in their building.

Mr. FORD. Would that happen with laminated glass?

Mr. SIESEL. This did not happen with laminated glass.

Mr. ROBERTS. I did not get the point.

Mr. SIESEL. It was in stock, in his place of business. There is no apparent reason. Mr. Richardson here is a technical man, and he can give you more of the technical point on it. Nobody can tell. That is the point I wanted to bring out. That is, they cannot tell when it will break or explode. It could be broken by hitting or it could be broken from a change of the elements, the weather, or anything else. This could not happen with a piece of laminated safety glass. In other words, if this was in a car and it happened to be sitting on the streets, and nothing struck it, it could explode.

This is another one, Mr. Chairman. The name of the party that the car belongs to is Mr. H. F. Bartholomew, 9016 Livingston Avenue, Whitehall, Mich. This is a quarter window in a 1959 Mercury station wagon. Shall I read the comments that this man sent in with this report?

Mr. ROBERTS. The Chair is of the opinion that this kind of testimony is rather far reaching. The committee has no way of bringing these witnesses here to testify as to the conditions under which these things occurred. I would much prefer that you have your expert testify as to the qualities of the glass, because I think we are getting a little far afield by bringing in exhibits that we cannot really tie down. I am not doubting the authenticity of this, the fact that there may be good evidence on it, but I think that it is a mistake for us to go too far on this in this record.

Mr. SIESEL. May I ask Mr. Richardson to comment? Thank you, Mr. Chairman.

Mr. FORD. Before that is done, we ask the dealer members of this association to pick at random various samples that have been sent in to them. It was no selected pick. We just picked at random. For that reason I do think that it has some relationship to the inquiry that the committee is making.

I am not putting their admission into evidence. I am pointing out that it is the way that it was obtained, to show that it could happen with tempered and not with laminated.

Mr. ROBERTS. I think that so long as we have the expert before us to testify as to the quality of the glass and as to the difference, the record will be served, but I do not think that we can get into these isolated instances in this record.

Mr. FORD. I agree.

Mr. ROBERTS. It is going too far afield, I think.

Mr. RICHARDSON. I am Henry M. Richardson of the firm of DeBell & Richardson, of Hazardville, Conn.

My field has been largely that of plastics and resins over the last 35 years. Of course, that is related in a way to the subject at hand, because in the case of laminated glass the inner layer is a plastic material, polyvinyl butyl.

Currently I am working on the American Standards Association technical committee which was mentioned by Dr. Ryan, I believe, last Friday. And among the various tasks that are being taken by the six task groups there is one on the durability of glazing and on the matter of the control of the quality and uniformity. I happen to be looking after that one as chairman of that task group.

In the course of these studies there will be brought together as much as possible of the available information, both as it now exists and from objective tests which will be made under the auspices of the task groups to submit that to the whole technical committee and to the American Standards Association for possible modification of the Z-26.1 1950 code.

I mention that as a background, because one of the things which must be taken into account is these unexplained spontaneous breakages of tempered glass.

Mr. FORD. In that connection, if I may interrupt you, I would like to lead the witness a little bit.

Mr. ROBERTS. All right.

Mr. FORD. Is this the way tempered glass breaks? Is that a fair example of it (indicating the exhibit previously mentioned by Mr. Siesel)?

Mr. RICHARDSON. Tempered glass breaks with fractures which are substantially perpendicular to the surface of the glass. To that extent this displays that. Usually, the tempered glass, for the purpose of the code for automotive glazing, should break into much smaller individual pieces than this. A limit is put on the size which is stated in the code.

Mr. FORD. Here is another exhibit sent in by one of the members of the association. Will you just tell the chairman the difference in the breakage in that?

Mr. RICHARDSON. A portion of this exhibit which I am showing you now, which is in the center, consists of a very large number of small pieces having an area, I would judge, on the average of about one-fourth inch each. That is the type of break which is expected of well-tempered glass. The larger pieces are outside the range which is now specified in the code.

Mr. FORD. That would go to the point of the thickness, too, would it not?

Mr. ROBERTS. Are these explosions typical of tempered glass or are they exceptional?

Mr. RICHARDSON. They occur in a very small percentage of cases. However, they do occur with rather dramatic effect. Our general understanding of the reasons for such breakage is that within the structure of the glass there may be a flaw or a discontinuity, either visible or invisible, so small that it cannot be seen. That gives a stress concentration. I think it has been pointed out previously before the committee that tempered glass is a glass which has been first heated to a high temperature approaching the softening point, and then is quickly chilled by means of air jets over the two faces of the glass which cause them to chill and to solidify. As the inner portion of the glass later cools; in its contraction on cooling, it pulls the two surfaces of the glass into a high degree of compressive stress which is balanced by the tensile stress that occurs in the inner portion of the glass.

Mr. FORD. Will you please describe that?

Mr. RICHARDSON. Thus the glass is under a very high stress. It is well known that if a stress concentration occurs within glass which is under tension, that is, within the interior of the glass, which is above its breaking point, a fracture will start, and once a fracture has started in tempered glass, no matter where within the glass, it quickly propagates itself throughout the entire piece. This is instantaneous, causing it to break into a large number of fragments. A highly tempered piece of glass will break into very large numbers of very small more or less granular pieces, with 90-degree angles on most of them.

Mr. ROBERTS. What are some of the other uses of tempered glass, other than being used in automobiles?

Mr. RICHARDSON. Tempered glass is used where glass is required to be extremely strong and to have a large impact resistance to withstand rough handling. It is often used in the swinging glass doors in architectural construction.

Mr. ROBERTS. Do they use tempered glass in show windows, in store fronts?

Mr. RICHARDSON. I do not believe they do.

Mr. BOUCHARD. That would not be the normal application of tempered glass.

Mr. RICHARDSON. On account of the size of it.

Mr. ROBERTS. What about showcase glass in stores?

Mr. RICHARDSON. I am not aware of that. There may be some instances. I think that Mr. Bouchard, probably, would know better than I on that point.

I was about to say that it is used in telephone booths—

Mr. FORD. Before you finish that, let Mr. Bouchard answer the question.

Mr. BOUCHARD. As to showcases I would say that would, also, be an unusual application for tempered glass.

Mr. ROBERTS. What is that glass that is used there?

Mr. BOUCHARD. Normally plate or crystal, one-fourth inch or larger.

Mr. FORD. Please proceed.

Mr. RICHARDSON. The outdoor telephone booths have recently been brought over to tempered glass, as a result of the experience that the telephone company in Canada had with it.

Mr. ROBERTS. You say that it is being used in that application?

Mr. RICHARDSON. It has recently been brought into use in this country in that application.

Mr. ROBERTS. What is the experience there?

Mr. RICHARDSON. The experience was outlined to me by the people at the Bell Telephone Laboratories. They stated that when the ordinary tools of vandalism that are used, often used, on these outdoor telephone booths, the tempered glass will have much less replacement than laminated glass. They have found that to be the case.

Mr. ROBERTS. You mean it is less in cost or less of it is destroyed?

Mr. RICHARDSON. They are both lower in cost and less likely to have to be replaced, with lesser breakage.

Mr. FORD. Why is that?

Mr. RICHARDSON. Because it will resist the impact of the ordinary tools of vandalism. Someone comes up and throws a rock at it or hits it with a stick or something of that sort, it is much more difficult for him to break it, and for that reason they have found that their replacement is less.

Mr. FORD. What if this vandal got into the telephone booth and became locked in it—would he have the same chances of getting out?

Mr. RICHARDSON. I have never had any trouble getting out of a telephone booth.

Mr. FORD. Suppose you are locked up, would the tools of an ordinary vandal be enough to get out of the tempered glass booth?

Mr. RICHARDSON. It would be more difficult to get out of it.

One point which was brought to my attention was that at the time when one of the telephone companies on the Pacific coast was considering the use of tempered glass in telephone booths, a shipment of tempered glass was obtained and was stacked in a warehouse. It was stacked under a space heater which blew a hot blast of air onto the surface of it. Without warning the two top pieces of tempered glass spontaneously broke. As the result of that one happening I was told in this interview that it delayed somewhat the adoption of tempered glass by that telephone company.

Mr. ROBERTS. In the beginning safety glass was required on automobiles being sold in a particular State by State legislation. How many States at the present time require laminated glass in cars?

Mr. RICHARDSON. It is my understanding that all States require laminated safety glass in the windshields.

Mr. ROBERTS. But they do not require any in the side windows or in the back window?

Mr. RICHARDSON. I think, perhaps, Mr. Siesel has that information.

Mr. SIESEL. There is one State that did require laminated glass in the automobiles. That was the State of Washington. The Automobile Manufacturers Association went in there and they have now had that law changed. There is no State today that has a law on the statute books that requires laminated glass in the side lights or in the rear lights.

Mr. FORD. That is why the association has been pushing legislation on this.

Mr. SIESEL. We have some statements here that will bring you right up to that point later.

Mr. ROBERTS. While on that subject, do all States require laminated glass in the windshields?

Mr. FORD. Yes.

Mr. SIESEL. I would say that there are only a few States that have it on their statute books, that is, making it a law, but up until now all of the car manufacturers have complied with the code of the ASA which stipulates that it should be laminated glass in the windshields.

Mr. ROBERTS. Does that code still stipulate laminated glass in the windshields?

Mr. SIESEL. Yes, sir; it does.

Mr. FORD. Yes, sir.

Mr. SIESEL. As you know, the ASA is not a law-enforcement agency.

Mr. ROBERTS. I recognize that.

Mr. FORD. I think, too, under State regulatory commissions, regulations issued under the authority of the statute would bring about that.

Mr. ROBERTS. That is as to State-purchased cars?

Mr. FORD. As to State-purchased cars; yes.

I would like to ask Mr. Richardson one more question.

You explained about the tensions and what happens by virtue of temperatures, et cetera, to tempered glass. Will you tell what happens to laminated glass?

Mr. RICHARDSON. The experience with laminated glass is that its properties are uniform and predictable. Laminated glass can be relied on to perform as it is expected it will perform; in other words, to break at a moderate impact which is, we hope, below what will damage the individual and which will still allow the individual vision through the windshield and through the glass after it has been broken, and which will allow egress of the occupant of the car without difficulty, in case he should be trapped, in case of fire, and so forth.

Mr. FORD. Thank you.

Mr. ROBERTS. Would you go into this cost matter?

Mr. FORD. I have that next.

Mr. ROBERTS. All right.

Mr. FORD. In Mr. Richards' testimony representing the Automobile Manufacturers Association, I believe he said it would cost between \$100 and \$250 per vehicle. Our figures, particularly with the reference to Chevrolet, indicates that it is \$3.80, and in an overall picture it indicates it is \$1.50. This is set forth in the Wall Street Journal by an article by Mr. Hanicke, which the chairman inserted in the Congressional Record on April 11. We are not too sure of that \$1.60

figure in my statement. We think, in all candor, that it would go higher than that—maybe up to \$4 or \$5, but certainly not the figure that Mr. Richards presented.

As to the desire for uniformity and standardization, mentioned by the Automobile Manufacturers Association, their very production of automobiles would seem to deny that. In *Time* magazine of March 24, 1961, it states—and I am sure with some accuracy—it is possible to buy a Chevrolet in more than 100,000 different combinations. Certainly that would not indicate much uniformity in the business.

The Automobile Manufacturers Association also stated to this committee, I believe, that legislation, when proposed in all of the States, be defeated. That is not correct; that is, that it has been defeated. As a matter of fact, these bills are pending in various States in one stage or another.

I think, also, there is some testimony with reference to safety devices and that tempered glass does not have features that laminated may have. We have been in touch with Dr. Hedwig Kuhn, of the Society for the Prevention of Blindness, and she states that not a single—that there is not a single recorded instance of a loss of an eye due to laminated goggles in the last 37 years.

In concluding, I would like to make three points very briefly: Our opposition to tempered glass is not motivated by an economic reason. Our dealers are very small; to them it is a very small part of their business in replacement. They would be in better position if laminated were exclusively used. That is in accordance with our suggestion on H.R. 903, but that is not our primary consideration.

We think that the safety factor very definitely is the overriding factor, regardless of what happens to the members of this association.

The Automobile Manufacturers Association also makes a point on the use of tempered glass in Canada, Europe, and so forth, but Mr. Richards neglected to mention that legislation requiring laminated glass was recently passed in Italy, France, and Japan.

Also in Europe the injury rate, compared to the United States, is very unfavorable—one-third of the number of cars and they have 50 percent more injuries.

And finally, someone appeared before you and tried to emphasize the fact that laminated glass would break, and by so doing implied that such breakage constituted danger. This is what the Cornell report covered, but I would like to remind the committee that laminated glass is designed to break for the purpose of the safety factor, but not to break and shatter as tempered glass does.

Also there is in the laminated glass field—I do not want to say a movement, but there is some great improvement that will be an added safety factor.

In conclusion, I think probably the best-informed man in the country both on tempered and laminated glass is Mr. Case, president of the Shatterproof Glass, Inc., at Detroit. I would like to ask the chairman to have him testify under subpoena.

Mr. ROBERTS. I am not sure about that.

Mr. FORD. For certain reasons. Or is that a matter for the full committee to decide?

Mr. ROBERTS. In its legislative capacity the subcommittee does not have subpoena power.

Mr. FORD. The reason I am requesting the subpoena I thought was obvious to the Chair.

Mr. ROBERTS. Is that the end of your statement?

Mr. FORD. Yes.

Mr. ROBERTS. You have a statement that you want to place in the record by Mr. Yudenfriend, as well as your own statement?

Mr. FORD. Yes, sir.

Mr. ROBERTS. Do you want that included in the record?

Mr. FORD. Yes, sir.

Mr. ROBERTS. It may be included, as well as your prepared statement.

(The prepared statement of Mr. Peyton Ford and the prepared statement of Mr. Herbert Yudenfriend follow:)

STATEMENT OF PEYTON FORD, GENERAL COUNSEL FOR NATIONAL AUTO & FLAT GLASS DEALERS ASSOCIATION, APRIL 18, 1961

Mr. Chairman and members of the committee, I am Peyton Ford, general counsel for the National Auto & Flat Glass Dealers Association. I am accompanied by Mr. E. H. Siesel, of St. Louis, who is chairman of our laminated safety glass committee; Mr. Henry Richardson, of DeBell & Richardson, an engineering consulting firm of Hazardville, Conn.; and Mr. Robert Eouchard, of Glass Distributors, Inc., Washington, D.C. They will answer any technical questions you may have.

We are appearing on behalf of the association to urge you to include laminated safety glass in H.R. 903. On March 28, Mr. James R. Turnbull, program director of the laminated safety glass committee of our association, appeared before you and presented our position with regard to the use of laminated safety glass and arguments in support thereof. He urged and I again urge that H.R. 903 include a provision which would require motor vehicle manufacturers to use laminated safety glass in all windows forward of seated passengers.

I will not repeat Mr. Turnbull's statement at this time, but I would like to summarize the points he made, to refresh your memories. It is the conviction of the National Auto & Flat Glass Dealers Association that tempered glass is not as safe as laminated safety glass for use in the windows of automobiles. Until recent years tempered glass was rarely used in the side windows of automobiles. The popular conception of safety glass remains to this day in the minds of most Americans as consisting of two pieces of glass laminated together with a tough layer of plastic. This identification has made the word "laminated" literally synonymous with "safety" in connection with auto glass. Because of this confidence the motoring public had in laminated safety glass, the auto manufacturers began a "silent switch" for economy reasons from the true safety glass to case-hardened tempered glass in 1956. Testimony in *F.T.C. v. L-O-F and General Motors*, No. 7643, established this and this committee should request the FTC to report its findings to you on the reasons for the switch by the major auto makers and its conclusions as to the suspected false advertising in connection therewith.

Experience has proved and is continuing to prove that tempered glass is far from being safety glass. The association has accumulated hundreds of accident reports involving tempered glass. One of the meaningful incidents in this compilation is the number of car owners involved who are surprised and shocked to discover that they did not have the kind of glass they had always considered as safety glass, that is, laminated glass. Besides providing statistics of glass breakage, this continuing compilation is a valuable source of auto-owner comments. A few typical comments are these: (1) Mr. Raymond Brosius, of Huntingdon, Pa., said of tempered glass: "I don't call it safety glass and it certainly is not fit for installation in cars or any licensed vehicle." (2) Mr. George Frey, of Philadelphia, whose tempered sidelight shattered while the car was in motion, posed a very simple question: "Is this safety glass?" (3) Mrs. Fred LaCour, of Alexandria, La., made this statement: "I have three small children and I feel that laminated glass is a must for them. I must be one of millions who want laminated safety glass." All three of these people had dangerous experiences with tempered glass.

The question of whether tempered glass was as safe as laminated glass was considered by the Interstate Commerce Commission 25 years ago. The findings made at that time, which Mr. Turnbull read to you 2 weeks ago, are still valid findings, despite attempts by the Automobile Manufacturers Association to assert the contrary. Laminated safety glass is still the best protection against a small hard missile. Laminated safety glass is still the only safety glass that prevents pieces of broken glass from flying through the interior of the automobile. Laminated safety glass is still the only glass that does not become opaque when cracked. Laminated safety glass is still the only safety glass that can be knocked out with the hand, elbow, shoulder, or foot of a trapped motorist. The Interstate Commerce Commission examiner making those and other findings recommended the use of laminated safety glass in interstate carrier vehicles. The ICC concurred. A regulation was promulgated to that end, which is still in effect.

In 1958 a preliminary report on automobile side-window glass was prepared at Cornell and read to the Society of Automotive Engineers at their summer meeting. This report was prepared by Boris Tourin, John W. Garrett, and John O. Moore. It has been used in support of the use of tempered glass. It has been asserted to indicate that tempered glass causes far fewer injuries than laminated safety glass. Examination of the report reveals it to be woefully inadequate for the study of a problem of such vital importance. In a nation that has approximately 70 million motor vehicles on its highways it would seem to me that a report involving only 715 automobiles is fantastically remote from accuracy. Be that as it may, examination of the report itself which concluded that "When glass damage occurred, observed injuries were associated with laminated rather than tempered glass," shows that conclusion to be based upon 713 automobiles which had laminated glass in the full side windows and 2 automobiles which had tempered glass in the full side windows. Many of the automobiles had tempered glass in the small vents and quarter windows, but only two had tempered glass in the major side windows. Tempered glass is much more durable in the quarter and vent windows while the greater area of the major side windows renders them more susceptible to shattering. The report found only 1 tempered glass injury and 26 laminated glass injuries, and proceeded to enumerate startling statistics showing how much safer tempered glass was than laminated. Such a report is an insult to scientific research.

The startling differences in the equipment of the cars used are traceable to the fact that only 1946-56 vehicles were utilized. As Mr. Turnbull pointed out to you, the "silent switch" began in 1956.

As I said, this report was given at the 1958 summer SAE meeting in Atlantic City. It was not delivered without challenge. Dr. J. D. Ryan, of Libbey-Owens-Ford, although he now seems to have changed his mind, made a very effective rebuttal of the findings and gave a strong endorsement to laminated glass. Unfortunately, the SAE, contrary to their usual policy, did not publish Dr. Ryan's statement and we have been unable to obtain a copy. It might be useful for this committee to request that statement from the SAE or from Dr. Ryan himself.

This report was presented at the hearings held by the motor vehicles and traffic regulations committee of the Missouri House of Representatives. The chairwoman of the committee asked, "How many of those cars (in the report) had laminated glass in the side windows?" Mr. Richards, who testified before you last week, answered the question: " * * * it was a case of both tempered and laminated * * * but the tempered had fewer lacerations, fewer injuries than the laminated. This seems to be the evidence that is mounting, that the tempered is less apt to cause injury than the laminated." The chairwoman of the committee expressed her doubt: "Now, Mr. Richards, isn't it a fact that it was the other way?" It is our contention that the chairwoman of the Missouri committee was correct.

We believe that we have provided much information about the dangers of tempered glass and we can provide more, as reports come in to us. Most of this information concerns tempered glass of one-fourth inch thickness or greater. It now appears that the auto industry is using tempered glass thinner than one-fourth inch, that is, three-sixteenths of an inch and seven thirty-seconds of an inch. According to glass industry technical manuals, glass thinner than one-fourth inch cannot be safety tempered, and I quote from a PPG technical manual, section C-2, page 6: "In general, glass which is one-fourth inch thick or more can be tempered fully, or to any other less degree, while glass which is less than one-fourth inch thick can be tempered only in smaller dimensions and lower

degrees of temper. In other words, thin tempered glass will be even more dangerous than that presently utilized. Now I would like to present to you a few random samples of shattered tempered glass sent to our association by various auto owners. These are all one-fourth inch or thicker. None of them show the widely claimed characteristics of breakage into small cubical, dull-edged fragments. How much more dangerous will be the even thinner tempered glass which the manufacturers contemplate installing.

We have here three typical samples of tempered breakage. Two are from automobiles. One, on the small cars, is a PPG Herculite that broke in stock. Obviously, what you see on these samples are not granules.

It may be said that these three samples represent just isolated cases of unusual tempered glass breakage, but in the past year our association has received scores of such samples, which can be made available to you if you desire. I might add that we also have samples of what appears to be ordinary window glass installed by the manufacturer as tempered glass in motor vehicles. One such sample has been submitted to the Federal Trade Commission to aid it in its investigation of the "silent switch."

Just recently in the same mail we received three samples of tempered glass which had shattered into slivers or large pieces rather than granules. These three samples were from three different automobiles but they were sent in by the same auto glass dealer. This tends to indicate that such tempered breakage is common.

I would like to mention another aspect of the AMA presentation before the Missouri Legislature's Motor Vehicle Committee. Judging from what Mr. Richards testified to there, it seems clear to our association that the AMA is not concerned with safety so much as it is concerned with the profitmaking of the automobile industry. In addition to an almost veiled threat to take the automobile assembly operations out of Missouri if tempered glass were outlawed by the State legislature (transcript, p. 5), the AMA witness time and again emphasized the AMA's desire to have uniformity in all the States. For example, Mr. Richards stated, "We would certainly warn any State against deviating from uniformity because of the cost and the problems it might entail" (transcript, p. 9). That association does not ignore safety, but it is definitely a secondary consideration.

The cry for uniformity and standardization by the AMA was repeated time and time again before the Missouri committee. I call this committee's attention to the AMA's stand on standardization taken at your March 28 hearing here. In addition, I call this committee's attention to the fact that the auto industry is probably the least standardized in the Nation. According to Time magazine, March 24, 1961, "It is possible to buy a Chevrolet in more than 100,000 different combinations." This is neither uniformity nor standardization. This argument should be ignored.

Mr. Richards' testimony in Missouri misrepresented the relative cost of the two types of glass. He stated that a changeover from tempered glass to laminated glass would cost on present cars between \$100 and \$250 per vehicle. This is not true, as can be shown by a Chevrolet pricelist which lists a laminated side window for a Corvair at \$3.80. This, of course, does not represent the true cost to the manufacturer. An optional accessory always has a higher price than the standard equipment because (1) far fewer are made, (2) a charge must be made for the trouble of providing the substitute and (3) a profit increment is included. A far more accurate estimate was made in Jack Hanicke's front page Wall Street Journal article of April 7, 1961, placed in the Congressional Record of April 11, 1961, by Mr. Roberts (p. A2382). Mr. Hanicke reported that the cost differential is 10 to 12 cents a square foot, or about \$1.50 per automobile. I do not think that any motorist would hesitate a second to pay \$1.50 for safer glass in his \$2,000 to \$5,000 automobile. I might add with reference to the preposterous statement made to the Missouri committee that examination of the auto pricelists of 1956 to date will not show any price reductions of \$100 to \$250 per vehicle.

At this point I would like to call your attention to some statements made to this committee by AMA representatives which are not true. First of all, in connection with the efforts to have various States amend their automobile laws with regard to safety glass, the AMA told this committee that attempts had been made in 10 States and all had failed. The fact of the matter is that bills are still pending in six States and in one State listed by AMA, to our knowledge, no bill was ever presented.

AMA's anxiety to prevent laminated glass from being used again for greater automobile safety has led their representatives to make several absurd statements. One of these was a remark last week stating that tempered glass safety goggles replaced laminated glass safety goggles because of the great number of eye injuries caused by the latter. This statement was reported to the Society for the Prevention of Blindness which referred our association to Dr. Hedwig S. Kuhn, an ophthalmologist, and head of the Kuhn Clinic, Hammond, Ind. Dr. Kuhn states that there is not a single recorded instance of a loss of an eye due to laminated goggles in the last 37 years. Dr. Kuhn has agreed to put her comments in writing and will send them to this subcommittee.

I have three points to make as a conclusion to my statement. First of all, the opponents of laminated safety glass will accuse our association of advocating laminated glass because its use provides more replacement business for our members. It is true that universal use of tempered glass will hurt the business of our members because it takes a very rich glass dealer to store what will be literally thousands of different shapes and sizes for various automobiles. But this factor does not in any way preclude our group or its members from letting the public and the Congress know how dangerous and how ill-advised is the use of this cheaper substitute which will also cause financial hardship for the auto glass replacement business. I have given you earlier in my statement three samples of the attitude of the motorists who do not have the special interest that our association and the auto manufacturers have in this controversy. I think a nationwide poll of automobile owners would prove that the arguments against tempered glass are true and valid and demand action to prevent tempered glass from adding to our national highway carnage.

Secondly, I was surprised to hear Mr. Richards of the AMA last week recommend the use of tempered safety glass because of its widespread use in Canada and Europe. We have learned many things from the old world, but none of these had anything to do with automotive safety. Tempered safety glass is used in Europe for the same reason that Detroit wants to use it here. It's cheaper. If Mr. Richards would have us use tempered safety glass, perhaps he would also have our cars equipped with some of the other equipment used in Europe. These include no sealed beams, mechanical brakes on many, many cars, small, limited-visibility windows, three-wheel motor vehicles and a turn signal that is so hard to see that our service people overseas refer to them as "idiot sticks," among other features of European cars. Moreover, Mr. Richards neglected to mention that legislation requiring laminated safety glass in windshields has recently been passed in Italy, France, and Japan. These countries are looking to American practices to help reduce their auto accident injuries. In Europe the injury rate they are trying hard to reduce compares to the United States very unfavorably. With one-third the number of cars they have 50 percent more injuries than the United States.

Finally, some witnesses before you may try to emphasize that laminated safety glass will break and by doing so to imply that such breakage constitutes danger. This is what the Cornell report which I have mentioned attempts to do. I would like to remind you that this glass is designed to break. The fact that it breaks easily prevents concussions and also affords easy escape from wrecked automobiles.

These safety advantages are enhanced by the inner plastic layer which prevents the broken glass from flying around. It also preserves the visibility required for safe motoring. Therefore, the fact that laminated safety glass breaks is not a disadvantage, but an engineered advantage. Furthermore, the National Auto & Flat Glass Dealers Association believes in and advocates the improvement of laminated safety glass. We advocate the development of a stronger, better, inner layer. We advocate, if it is scientifically possible, the improvement of the glass itself. We believe such improvements, certainly the first one, can be achieved. It should be remembered that today's laminated safety glass was designed originally for automobiles of 25 years ago. Relatively few plastics were available then. There have been hundreds of plastic discoveries since that time. We do not believe that tempered glass, which is not now safe, can be made safe. Perhaps it can be made harder, but this would make it more dangerous. It would make escape from a wrecked automobile even more difficult. It would make the explosion of the glass upon penetration that much greater. Laminated safety glass can and should be improved. We recommend that all cars in America be required to have laminated safety glass in all windows forward of

the passengers and that every effort be made to improve laminated safety glass. If science cannot make laminated safety glass even safer than it is now, perhaps it can discover why it cannot be made cheaper by \$1.50 per automobile, since that is the price the automobile industry is demanding for our safety.

A PRESENTATION IN BEHALF OF AN ADDITION TO H.R. 903 REQUIRING THE USE IN MOTOR VEHICLES OF LAMINATED SAFETY GLASS FORWARD OF SEATED PASSENGERS

My name is Herbert Yudenfriend. I am the assistant manager of the Stott-Hecht Glass Works, 418 North Sixth Street, Philadelphia, Pa., distributors of flat glass products of major domestic producers including Libbey-Owens-Ford and Pittsburgh Plate glass.

In my opinion there is one danger which has not been listed and is the most insidious of all. I refer to the fact that tempered glass when used as an automotive glazing material tends to, in effect, wear out without any warning to the car owner or its occupants, and without any obvious damage to the glass itself.

The underlying technical theory behind this incredible danger is quite well known, and has, in fact, been reaffirmed by the recent writings of some of the most respected authorities on glass technology including several on the research staffs of both the Pittsburgh Plate Glass Co. and Libbey-Owens-Ford. This theory was substantiated by laboratory studies conducted by one of the largest, most important companies in the world. It merely remained, then, to see if these findings could be verified in a field study; that is, to see if tempered glass really wears out after it has been in automobiles under normal driving conditions over a period of time. In order to test this theoretical and laboratory data I gathered 37 tempered front door glasses (all from the same year, make, and model) which had been in use for from 18 to 30 months and were free from such obvious damage as deep scratches or chipped edges. These were tested by the United States Testing Co. using procedures outlined in the ASA code. The data was then compared to the results of the same test made on new front door glasses of the same type made by the same manufacturer. The results confirmed the theory and the laboratory findings beyond a shadow of a doubt. After only 18 to 30 months of use under normal driving conditions and with no obvious damage, these 37 door glasses were from 33½ to 40 percent weaker than the new glass. As 18 to 30 months represents considerably less than one-half the average life expectancy of an American-built automobile, an extension of these findings seems to indicate that little or none of the original strength of tempered glass will be available when it is needed most, since the overwhelming majority of accidents occur to older cars. The picture seems grimly clear, and the implications are obvious.

We have been asked by the Automobile Manufacturers Association (AMA) not to disturb the ASA code because of the importance to the manufacturers of conformity to a national standard. But are we to protect conformity at the expense of safety? Without safety, of what use is conformity? Is it not the right of the people to expect that our first concern be conformity to safety?

It has been often stated by the AMA that the ASA code was written by representatives from some of our most respected engineering organizations among others. However, a careful analysis of the payroll affiliations of the representatives of these respected engineering societies indicates that the automobile manufacturers and their prime suppliers have substantial control of the committee which wrote the code. This became so obvious that despite the overwhelming 25-to-8 vote to reaffirm the present code, the safety standards board, sitting in review of this decision, utterly repudiated it and, for perhaps the only time in history, ruled that the vote did not represent a true consensus. As a result, a new technical committee has been formed to investigate the objections which have been raised concerning tempered glass.

Spokesmen for the Automobile Manufacturers Association when naming the National Bureau of Standards, the ICC, and other Government agencies as participants on the ASA committee have implied that this indicates Government support for the code. A careful examination of the record shows that representatives of Federal agencies take pains to have the minutes of hearings show them as not voting. Their function seems to be that of impartial consultant and resource personnel and their presence on this committee does not per se indicate either agreement or support on the part of themselves or the Federal Government.

A careful analysis of the present ASA code indicates how inadequate it is in the light of modern day automotive glazing. Since this code was adopted we have seen the glass area in automobiles increase so sharply, and the nature and type of glass being used has changed so radically that many of the tests in the code are either obsolete or totally inadequate. To be specific, I cite briefly the following examples:

(1) There is not a single quality control requirement covering the manufacture of tempered glass.

(2) At the time the present code was approved only one type of tempered glass was in general use. At the present time at least four different types of tempered glass are being used as original equipment by the various car manufacturers. Each of these types has a somewhat different set of properties, and there is actually a considerable difference among them in terms of the amount of protection which they might afford. Yet there is nothing in the code to clarify, define, or restrict the type of tempered glass being used.

(3) Because of the considerably increased size and compound bends of many of today's windshields and backlights, we are faced with a problem of visual distortion and acuity which was unimaginable in 1950. In addition, we are to assume that the tests applied to 12 by 12-inch samples give us a true picture of the safety performance of automobile glass parts as large as 32 inches by 84 inches which operate under stresses unknown in 1950.

(4) Not even the Automobile Manufacturers Association will deny that the mounting of automotive glazing materials has undergone a radical change since 1950. The advent of new models, such as the hardtop, have presented entirely new problems for mounting glass. Yet the current ASA code does not have a single standard relating to mountings or the application of the various approved types of glazing in these mountings.

A more detailed analysis would undoubtedly reveal many other areas of weakness in the present code.

The automobile manufacturers have continuously pointed to the fact that in Europe tempered glass has been used for many years. From this we might draw the conclusion that the European experience relating to traffic safety must be vastly superior to ours, since we are being asked to emulate them with regard to tempered glass. The record, however, belies this conclusion. According to a recent United Nations Economics Commission report, in 1960 more than 60,000 people lost their lives in traffic accidents in Europe. In the same year less than 39,000 lives were lost due to traffic accidents in the United States. This is despite the fact that there are more than three times as many cars on the road in the United States than there are in Europe.

I have attempted to describe a small part of the data and facts which are available and which bear directly on this controversy. Everything presented in this statement can be fully documented if it is deemed necessary at some future time; however, all of this material can be best summed up by a quotation from Prof. C. J. Phillips' book "Glass: The Miracle Maker" in which he says, "It [tempered glass] must not be confused with laminated glass and is not intended to replace that type in the fields for which the latter was developed." There is universal agreement that laminated glass was developed as the automotive glazing material we know as safety glass.

Mr. FORD. We could put on a further demonstration for the Chair in this area, but I think that enough of that has been done.

Mr. ROBERTS. We will have to conclude, because I have a quorum call I must answer.

Mr. FORD. May I ask this of the Chair? Could we leave the record open? There are a few more points that I would like to make.

Mr. ROBERTS. We can leave it open for your statement—I am not at all sure that I can hear it, however.

Mr. FORD. I do not mean to hear from me. I wish to submit other material.

Mr. ROBERTS. Yes, sir; I will be glad to have you do so.

Mr. FORD. Thank you.

(The information referred to follows:)

STATEMENT OF HENRY M. RICHARDSON OF DE BELL & RICHARDSON, INC., HAZARDVILLE, CONN., REPRESENTING THE NATIONAL AUTO & FLAT GLASS DEALERS ASSOCIATION IN THE TECHNICAL ACTIVITIES CONNECTED WITH THE ASA Z-26.1, AMERICAN STANDARDS SAFETY CODE FOR SAFETY GLAZING MATERIALS FOR GLAZING MOTOR VEHICLES OPERATING ON LAND HIGHWAYS

I would like to amplify somewhat the statement as made by Dr. Joseph D. Ryan in the hearing of April 14, 1931, before this subcommittee in regard to the investigations to be made by the six task groups of the ASA Z-26 Technical Committee.

The programs which have been assembled by these various task groups are designed to supply the necessary technical data concerning both laminated safety glass and tempered glass as used in automobile glazing, and to provide a basis by which to review the present ASA Z-26.1 code for the purpose of removing the objections which were stated in the negative votes. If this information is made available it should provide some numerical guidance to your committee to clear up some misconceptions and conflicting statements which may have gotten into the record.

I believe that each of the particular task groups will make its own contribution. In the first place, group 1 is covering the statistical studies, literature, and technical reports which bear on the controversial issues.

Task group 2 is making a study of the fracture characteristics of both laminated and tempered glass in all of the varieties which are being used or proposed for automotive glazing and will correlate these characteristics with the injury studies coming through the efforts of group 1.

In line manner, group 3 will restudy the visibility properties of glazing materials of all of the types used or proposed, both intact and fractured.

Group 4 will study the amount of energy that it takes to break glazing materials of all types as well as the energy absorption and penetration of the glazing.

Under group 5 there will be a study of egress or the ability to escape through the window or windshield openings of cars when glazed with the various types of automotive glazing.

Lastly, group 6 will study the durability and permanence of the physical properties of glazing materials as they are exposed to normal use and also endeavor to establish reliable non-destructive methods of determining the quality of both tempered and laminated glazing.

I would like now to point up the statement in Mr. Peyton Ford's presentation of April 18 on page 4, that out of the 715 automobiles in the sample included in the 1958 preliminary report by Tourin, Garrett & Moore, that only 2 of these automobiles were equipped with tempered glass in the full side windows.

On reading the transcript of the hearing of April 14, page 240, I think Mr. Rugg must have said that tempered glass must be cut to size before it is tempered because once it is tempered it cannot be recut.

On page 248, Mr. Richards made reference to "a peculiarity of medical science that we have papers from Germany and Switzerland that indicate that the possibility of brain concussion is less with tempered glass than with the laminated glass because when the tempered glass does give there is no resistance." I think it would be well if the actual references were cited so that they could be studied and judged on their content. Likewise, on page 250, Mr. Rugg's statement, "Now, your question in regard to laminated and tempered glass, with regard to fracture and concussion, we have found indications that there is more chance of concussion with laminated glass than there is with tempered glass. We are running more tests on that."

"The reason is that to produce concussion you have to have a time in which pressure is held on the head, and for the brain to funnel back to the back part."

I think this, too, should be documented for clarification.

Mr. ROBERTS. Recently, I had the pleasure of meeting and visiting with Mr. Walter C. Jerome, president of Hollow Boring Corp., of Worcester, Mass., a good friend and constituent of our colleague, Congressman Harold D. Donohue.

Mr. Jerome, who has given a great deal of thought to the problem of highway safety, has developed his own safety automobile which he calls Sir Vival.

Mr. Jerome has a statement for the committee, describing his safety auto, which I am sure members will find very interesting.

STATEMENT OF WALTER C. JEROME, PRESIDENT OF HOLLOW BORING CORP., WORCESTER, MASS.

Mr. JEROME. Mr. Chairman and gentlemen, I am particularly pleased to be here today because a crash-proof, or safety car, has been a goal of mine for decades. In fact, I believe I have succeeded in transforming vision into practical reality. The time is past when we can afford the luxury of wondering if we Americans should bend our minds and backs to the task of mass-producing safe automobiles.

I submit that if we don't move on this frontier, the United States will be on the outside looking in. Reliable reports, with which you gentlemen are familiar, I'm sure, indicate the Soviet Union is even now moving toward mass-producing a safety car.

If Russia introduces safety vehicles this year it will take our automobile industry at least 3 years to catch up. This would be a staggering blow to the private enterprise system in America, to say nothing of the Nation's loss of world prestige.

As constituted, our automobile industry is a sterile proposition. The entire framework resembles the old multipatched innertube. It is significant that, while all roads in America's multibillion-dollar highway system are designed for the eye level of cars of the 1920 to 1950 era, our cars of today have been deliberately lowered to reduce vision to a dangerous level.

Windshields are slanted so they retain vision-impairing debris and dirt; interiors are perfectly designed to project occupants through the windshield. This has been the story, year after year, with monotonous regularity.

All our safety efforts, or virtually all, have been to fit the Nation to the vehicle, with restrictions concentrated on that much-maligned whipping boy, the American driver.

Despite the skill drivers have acquired, they need help and will need it in larger doses as the private automobile fleet increases each year.

I believe that you gentlemen can strike a smashing blow for automotive safety, and for our Nation, by recommending that all the Federal Government purchases of passenger vehicles be of an approved crash-proof type.

I sincerely believe that we can't afford to wait any longer for the automotive industry to put its house in order. We are waiting for something Detroit will never provide of its own volition.

Yet, the Government could obtain action in this field overnight by requiring that all its passenger vehicles be of crash-proof specifications. I believe a trend in this direction would soon develop into a tidal wave that would sweep the Nation.

And perhaps the most interesting facet of the plan is that genuine safety cars could be delivered in 1962. The industry would scramble to tool up to meet the Government's requirements as it does to meet military contracts. My own safety auto, "Sir Vival," is adaptable to mass production, and might well be used as a standard for industry to equal or better.

In addition to demonstrating to the world this Government's concern for human life, Federal action in the automotive safety field would help meet three vital national problems.

In the next 10 years, our economy will have to expand to make room for 26 million youngsters who will be looking for jobs.

This will require a 40 percent increase in the Nation's payroll.

First: Four million inexperienced drivers of this group will be licensed each year. Increased numbers of collisions must be anticipated. At the present accident rate, more than 100,000 youngsters are marked for annihilation. One out of two will be injured in their first 10 years of driving.

Second: Our railroads are now on the tracks to oblivion and need increasing Government aid to halt their downward slide. National security, as well as our economy, demands a healthy railroad system.

Third: At today's rate of consumption, America's 660,000 oil wells contain only 10 years' supply of petroleum. Should our oversea supplies be cut off, rationing of oil would be inevitable. In contrast, Russia with double our resources is pumping from only 40,000 oil wells, equivalent to a 200-year supply as compared to America's 10-year.

SOLUTIONS

First: I propose that "crash-proof" cars be produced at an 8-million per-year rate. Let the Government finance the sale of 4 million of these vehicles to new drivers. In effect, the 26 million youngsters who need jobs in the sixties would be employed producing their own transportation. This action would spark the economy to new heights for decades, and use of the safe vehicles might well produce such a saving in lives, injuries, and accident costs * * * as to erase our staggering national debt in our children's lifetime.

Second: To preserve petroleum supplies I suggest removing overland truck traffic from crowded highways by routing it over the railroads' right-of-way; to be towed in convoys on special tracks or in "piggyback" fashion. Electrify the locomotives. Both the railroads and the trucking industry would benefit and our highways would be safer and spared the terrific abuse of heavy truck traffic.

Third: I propose that the Nation's dwindling oil supplies be conserved by prohibiting the manufacture of new vehicles after 1965 unless they are powered by nonpetroleum engines. The inefficient internal combustion engine, which delivers 5 cents' worth of motion for every dollar's worth of gas, should be replaced by bottled gas, steam, electric, or nuclear-powered engines. The conversion would preserve our national lifeblood of petroleum and boost our economy. Perhaps, gentlemen, these proposals seem too drastic for our slow moving economy. But we exist in the rocket era that was created in my home city of Worcester—I well recall the raised eyebrows when Professor Goddard predicted that rockets would one day reach the moon. Fantastic, we thought. Yet today we are in a grim struggle to outdo the Communists in a field where we might well have captured a commanding lead. We lost because America was just emerging from the horse and buggy era and was not ready to digest Professor Goddard's science. Today, America is alert. Motorists are ready for a change. To a man they would welcome security from highway slaughter.

The struggle of this committee to persuade the automotive industry to promote seat belts reminds us that the famous Concord carriages made in New Hampshire during the Civil War were equipped with these devices. It is important to recall that when the Russians startled the world with their sputnik, President Eisenhower went on record before the world, stating that America was not competing in rockets. Rather, he said, we are producing peacetime goods. Automobiles are considered America's major product.

Over 100 million of these vehicles have been manufactured in this Nation. Yet the automotive industry has failed to produce even one prototype crash-proof car for public approval. In addition, today's vehicle is basically the same as produced at the time of Professor Goddard's first homemade rocket. The fact is that private enterprise is completely defaulting in the field that may win or lose the cold war. The Congress, by taking decisive action, would propel the automotive industry into the rocket era overnight. It is important to note that this program only requires governmental financing, similar to FHA programs. Funds would return to the Government almost as fast as expended, and the increased prosperity of the Nation would result in substantially larger Federal tax income return.

I submit to the Congress that it is poor economics to allow an industry that has only \$3 billion invested in production facilities to foster dangerous automotive designs on the Nation when losses from traffic damage will exceed the total national debt during the average driver's career.

By using the God-given abundance of labor that is now idle, to develop and produce "crash-proof" cars, this Nation would assert moral and economic leadership of the world.

We would be on our way toward "new frontiers," riding proud and with clear conscience because the "dignity of man" would have been restored and our "national purpose" clearly defined.

Mr. ROBERTS. We appreciate your appearance and testimony, Mr. Jerome.

Mr. JEROME. Thank you, Mr. Chairman.

Mr. HARLAN V. HADLEY (manager, Washington Office, Automobile Manufacturers Association). May I ask that the record be kept open for the purpose of the Automobile Manufacturers Association to submit further testimony to counter these rather extravagant claims and allegations made by the laminated glass witnesses today?

We would like our safety engineers and glass scientists to read the transcript and to see if there is anything that they care to answer.

Mr. ROBERTS. Yes, sir. The record should not be kept open indefinitely. We will try to keep it open for 10 days.

Mr. FORD. I want the record to show that I am not an expert.

Mr. ROBERTS. Dr. Fletcher D. Woodward, clinical professor of otolaryngology, University of Virginia Hospital, Charlottesville, Va., nationally known for his work in highway safety, has been of great assistance to this subcommittee.

The following address by Doctor Woodward, printed in the March-April 1961 issue of *Police*, published at Springfield, Ill., by Mr. Charles C. Thomas, will be of interest in connection with the legislation under consideration in these hearings:

AN APOLOGY TO THOSE WHO ARE ABOUT TO DIE

(By Fletcher D. Woodward, M.D.)

(EDITOR'S NOTE.—Dr. Woodward is clinical professor of Otolaryngology at the University of Virginia Hospital, Charlottesville, Va., and a member of many national ear, nose, and throat organizations. In addition, he is president of the American Laryngological, Rhinological, and Otological Society and past chairman of the American Medical Association Committee on Medical Aspects of Automobile Injuries and Deaths. Dr. Woodward is also a member of various State and national conferences on automobile accidents and their prevention and a frequent contributor of papers on this subject in various medical journals.)

(One of the major bright spots on the horizon of human welfare today is the increasing interest of the medical profession in the problems of traffic safety, traffic accidents and the prevention of this needless toll of tragedy on our streets and highways.)

As a physician who has been a student of automobile accidents and deaths for many years, I wish to apologize to those 20,000 Americans who will needlessly die on our highways this year and also to those 2½ million Americans who will needlessly be injured. If the remedies presently available had been adopted, 50 percent or more of our highway deaths and injuries would have been prevented this coming year.

These remedies would not only have prevented many crashes but would have offered protection to many of the car occupants at the time the crash occurred. The reasons for the nonadoption of these remedies are:

(1) The public is not yet interested enough in highway accidents and injuries to demand their employment.

(2) Their legislative representatives are certainly not going to do anything until an aroused public makes this demand. When this time will come is, of course, unknown.

Since the number of cars on our highways will increase from 70 million this year to 114 million in the next 15 years and by that time nearly every family will have experienced tragedy, perhaps the adoption of these remedies is not too far distant.

In the meantime, physicians are busily preparing an outline of what these remedies are to be. They fall mainly into two classes.

CRASH PREVENTION REMEDIES

In addition to all the slogans, police patrol, vehicle and highway improvements and the indefatigable work of the many fine local, regional, State, and national safety organizations the traffic toll will continue until these fundamental remedies are adopted.

Education

Driver training courses should be provided for all our teenage youngsters as well as for adults. This course should be a required one, and if time is a factor in a crowded curriculum such courses as physical education, home economics, art, music, and shop instruction should yield time to driver training. A certificate from such a course should permit a youngster to apply for a driving permit at the age of 16 instead of 18, which otherwise should be the legal minimum limit. Such a certificate could also result in lower insurance premiums. These courses are invaluable in teaching safety from all approaches such as the danger of driving while drinking, the danger from speed and recklessness, and the value of safety features in design as well as safety belts and shoulder harnesses.

Alcohol and driving safety

Since the average individual suffers impairment of driving skill at a blood alcohol level of five one-hundredths of 1 percent, let us make this the critical level for conviction instead of fifteen one-hundredths of 1 percent, a far too generous figure.

A chemical test of the breath or blood should be mandatory in all cases in which driving while drinking, but not intoxicated, is suspected. This test would free the innocent as well as help convict the guilty and should be administered by a properly qualified testing officer who has been trained both in the care of his equipment and the technique of its use, or by a physician. The alternative to such a law is the implied consent law as has been provided in New York and other States.

The result of the chemical test should be accepted as *prima facie* evidence, and mandatory laws for the various zones of intoxication should be provided.

The present laws exonerating a driver of drinking and driving with a blood alcohol level of less than five one-hundredths of 1 percent are proper. The present laws punishing those with a blood alcohol level of fifteen one-hundredths of 1 percent or higher are often proper but are not enforced. These laws should be subject to study and revision, and should also be strict and mandatory. The greatest problem is in the twilight zone from six one-hundredths to fifteen one-hundredths of 1 percent. For this zone a new set of laws should be enacted following the suggestions of Mr. William M. Plymat of the Preferred Risk Mutual Co. of Des Moines, Iowa. These laws should be less strict than those for people with a blood alcohol level of fifteen one-hundredths of 1 percent or higher but should be severe enough to control the average drinker, for this is the range of the social drinker.

These laws, as I have previously said, should be mandatory and strict enough to stop a driver who is not drunk and thinks he is perfectly capable of handling a car in our modern high-speed traffic. The results consistently prove him wrong. Many States have found a point or demerit system to be the best solution to the problems of suspension or revocation of license for drinking and driving. However, if testing of the breath or blood could be made mandatory, its results accepted as evidence and mandatory laws provided, this would be the simplest method of handling this whole problem.

In answer to the many arguments, pro and con, in this complex problem, the physician is not interested in whether the degree of intoxication is reached on an ascending or descending curve of intoxication. He is not concerned with the type or rapidity of consumption of the alcoholic beverage or whether it is consumed on a full or a fasting stomach. He is not concerned with whether the individual is a beginner or an experienced drinker. He is only concerned with the fact that no one should operate an automobile in our modern high speed and complex traffic patterns with an alcohol blood level higher than five one-hundredths of 1 percent.

The laws concerning the punishment of these offenses should not be left to the discretion of the judge or consulting physician, for they have both failed miserably in the past. As a citizen, a physician should urge that full-time traffic court judges be appointed with a salary commensurate with the importance of their function. Also, proper and dignified quarters should be provided for this most important court.

SPEED AND RECKLESS DRIVING

Since speed and reckless driving are causative of some 30 percent or more of deaths resulting from crashes, I suggest that more State police be utilized, that the public be educated again to support them and to cease playing cops and robbers on the highways, and that proper laws be enacted and made mandatory. We should endorse and enforce the uniform adoption of the speed limits suggested by the National Safety Council. These limits are 60 miles per hour for day, 55 miles per hour at night, and 35 miles per hour in urban zones, all with a 5-miles-per-hour tolerance. Dual lane and other modern highways should likewise have a minimum limit of 40 miles per hour.

These limits may seem somewhat low to many readers, but until the manufacturers provide us with safer machines from the standpoint of human engineering, I believe that these limits should be considered the maximum under present conditions. If and when the day comes that manufacturers provide cars employing the many safety suggestions previously offered by the medical profession, then these limits can be raised accordingly. Again, the laws governing speed and reckless driving should also be mandatory and strict enough to deter these individuals from excessive speed and recklessness, for the public must realize that driving a motor vehicle today is a privilege and not a right. Nor should sympathy be wasted on the so-called "hardship case," for you may be

his next victim. He knows the wages of each offense, whether set by mandatory law or as a result of the point or demerit system, and no deviation can be allowed if the number of deaths and injuries is to be curtailed.

CRASH INJURY PREVENTIVE REMEDIES

Automotive design and safety

Since some crashes are unavoidable and others inevitable, it is important that the machine itself be designed and safety features provided to protect the occupants. At the present time the destiny of thousands rests in the hands of a comparative handful of men, the designers and engineers who plan next years cars without benefit of medical advice or consultation. It is also astounding as to how little money is spent on research for safety features compared to the large sums received from the sale of their products.

The Committee on Trauma of the American College of Surgeons has been concerned with the importance of safety design of the vehicle and the provision of safety features as standard rather than optional equipment. Their efforts have the wholehearted support of all physicians, particularly the American Medical Association's Committee on Medical Aspects of Automobile Injuries and Deaths. Although this committee is primarily interested in the medical aspects of the problem their studies and the reports of research groups, such as the Cornell study group, has convinced them that design should occupy a high place on the list of objectives.

This decision is based upon the fact that 12 miles per hour seems to be the critical speed, for at this point the average steering wheel collapses, leaving the steering post as a lethal projection; no one can protect himself from death or injury, and if thrown out of the car the chances of getting killed or hurt are five times greater than if one had remained inside the protective shell of the vehicle. The seat belt, or, preferably, the shoulder harness is the best safety feature than can be provided at this time and, if worn, will prevent some 60 percent or more of deaths and injuries. The belt should be anchored to the floor of the car, and must meet the safety specifications of the Society of Automotive Engineers. If belts are not provided as standard equipment, provision should at least be made for their attachment.

Many suggestions have been made which would contribute to passenger safety at little extra cost for the manufacturer. Among these suggestions are: a collapsible steering assembly; Ford's deep dish steering wheel with a broad steering post covered with protective crash padding; the same type of padding over the dashboard, the back of the front seat and other dangerous areas in the car; seating the passengers in the front seat farther away from the dashboard; firm anchorage of seats, visual or audible speed signals; and additional small red lights on the top of the car to flash when speeds of 70 miles per hour have been obtained. The latter would serve as a warning to the police as well as to other motorists that a car is driving at excessive speeds.

In addition to these signals, the following devices are recommended: Safety door locks; polarized headlight lenses and an oppositely polarized spot on the windshield to prevent headlight glare and blinding at night; better designed windshields from an optical standpoint; high extensions of the seat backs to prevent whiplash injury to the neck; a recessed shelf behind the back seat to prevent injury from secondary missiles; less chrome and other reflecting surfaces to eliminate glare especially in night driving; elimination of projecting knobs, buttons, and levers; shock absorbers for bumpers or energy absorbing material in the front end, and many other features.

If the front seats are firmly anchored to the floor and if the backs of these seats will not tip forward then small accessory seats for children can be made to hook over the top of the seat and secondary belt extensions will go around the waist of the very small youngsters. Older children should be made to ride standing back of the front seat or, if riding in the front seat, in cases of impending crash, they should be instructed to dive to the floor with their backs to the front floor area or back of the front seat, wherever they may be.

Most of this extra cost could be compensated for by less chrome, the omission of hood ornaments, clocks, and radios and many other accessories as standard equipment. As I have previously said, one is astounded as to how little has been spent on safety research by the manufacturers compared to the vast sums which they receive from the sale of their products.

I am sure that consultation with the medical profession on the aspects of human engineering as related to automotive engineering would soon establish many related facts; these would bear fruit by reducing deaths and injuries at the time of a crash and converting many of the potentially severe to critical injuries to those of relatively minor nature.

Licensing of the driver

The suggestion has been made that three classes of driver permits be granted: one for private vehicles, another for commercial vehicles, and a third for passenger-carrying vehicles. Each person could thus acquire one or more such permits depending upon his vocation and desire. If suspension or revocation of a permit is ordered by the court it could apply to all three categories or to one or more depending on the offense or series of offenses. For instance, a truck driver could continue to drive his truck but would be barred from driving his private car.

As physicians we also believe that on each driving permit a space should be provided to state the blood type of the individual, his allergies to various drugs if any, and whether he is taking anticonvulsive or anticoagulant drugs or is a diabetic taking insulin. This information would be of tremendous value in the care of unconscious patients brought into the emergency rooms of hospitals.

Re-examination should be required every 3 years for drivers of private vehicles but every year for those who wish permits in the other two classes. This would also apply to drivers of school buses and those past age 65. The automatic reissue of driving permits every few years should cease, for under this system the only requirement for reissue of a permit is to be alive.

It has also been suggested that referral medical clinics be established by cities, towns, or counties to be staffed by doctors appointed by local medical societies, with consultants available in psychology and the medical specialties. It would be the duty of this referral medical group to pass on the physical and mental fitness of those people referred to it by the courts, the police, or other physicians. Their opinion would be particularly valuable in the consideration of the licensure of repeated offenders.

State medical societies are appointing traffic safety committees to serve as consultants to State legislatures and licensing authorities on the medical aspects of this problem.

The American Medical Association has recognized its responsibility in this field and through its committee on medical aspects of automotive crash injuries and deaths has prepared two pamphlets. One entitled, "Are You Fit To Drive?", is written in lay language and illustrated for the instruction of patients whose condition may pose such a query. This little pamphlet is attractively illustrated with color and line drawings. It briefly discusses many problems in subjects such as: "Before You Take the Wheel," "Emotional Upsets," "Drowsiness," "The Taking of Medicines," "The Drinking of Cocktails," "The Importance of Vision," and other interesting features. This booklet may be obtained from the Association of Casualty & Surety Companies, 60 John Street, New York, N.Y., and is particularly suitable for distribution to the patients in the doctor's office. If wide distribution of this pamphlet can be secured we believe it will be of considerable help in the solution of this problem. A second pamphlet is entitled "A Medical Guide for the Physician to Determine a Patient's Fitness to Drive" (J.A.M.A., 169: 1195-1207, 1959). This pamphlet covers the medical aspects of the problem for the first time and serves as a reference to the physician when confronted by the patient who has a problem concerning a physiological state, a pathological condition, an emotional disturbance, drug therapy or alcohol.

The committee is at present beginning the preparation of a "Guide to State Licensing Authorities." This will be more comprehensive and detailed, and will set certain physical standards for certain conditions. It is hoped that the State medical societies will make the conditions of patients with convulsive

seizures, mental, or severe emotional disease, and those diabetics taking insulin, reportable to the the State health department. These names would then be furnished by the State health department to the motor vehicle licensing authority of each State and would serve as a guide and double check to them in the licensing of these individuals. The publication of this guide is somewhat in the future, but the need is great and its preparation will be carried out as rapidly as possible.

Of course, the physician's first duty is to render adequate definitive treatment to the injured and of these results he is justifiably proud. He is likewise interested in seeing that first aid care and emergency transportation are adequate and available and that properly trained and equipped rescue squads are established in each community. These squads should be a part of the Civil Defense program.

SUMMARY AND CONCLUSIONS

In spite of the physician's accomplishments in the care of the wounded, his main interest, as in all other major medical problems, is in the prevention of disease. To attain this goal I would like to present the following summary of the aforementioned recommendations.

1. New laws to curb drivers who have been drinking.
2. Proper and uniform speed laws.
3. Minimum safety features in design and equipment standard, not optional, features.
4. Referral medical clinics.
5. Three classes of driving permits for private, commercial, and passenger-carrying vehicles.
6. Driver education courses in all public, private and parochial schools.
7. The consideration of a point or demerit system.
8. More State police.
9. Further engineering studies of highways and all related factors as well as of the machine itself.
10. More time and money spent on basic research.

The physician is proud of his definitive care of the injured but does not believe that his duty as a citizen and a physician has been fully discharged until preventive measures have become facts and are reflected in the daily automotive statistics.

FEDERAL STANDARDS FOR MOTOR VEHICLES

Mr. ROBERTS. For information of members of the committee, Federal Standard No. 122, applicable to the purchase of certain motor vehicles for Federal agencies, referred to in these hearings, will be included in the record at this point:

Fed. Std. No. 122

JULY 1, 1957

(KKK-T-00811 (GSA-FSS),

KKK-A-845, KKK-A-851,

KKK-T-716, KKK-T-719,

Issues in Effect)**FEDERAL STANDARD****AUTOMOBILES, STATION WAGONS, AND LIGHT TRUCKS; STANDARD UNITS, STANDARD PERMISSIBLE OPTIONS, AND JUSTIFIABLE OPTIONS**

Authority.—This standard is issued pursuant to the Federal Property and Administrative Services Act of 1949, as amended, and its application to the purchase of commodities referred to herein is mandatory on all Federal agencies, except that effective date for the Department of Defense is October 1, 1957, unless a later date is provided by amendment.

S1. Purpose and Scope. — This Federal standard limits the procurement of Government automobiles, station wagons, certain light trucks, and carryalls to the smallest number of vehicle types (and appurtenances) required to adequately perform the services required. These standard units have been adopted for use in consolidated purchases to afford suitable vehicles, procured with shortest delivery dates, at the lowest prices obtainable.

S2. Classification.—Equipment standardized hereunder is classified as Standard Units, Standard Permissible Options, and Justifiable Options.

S2.1 Standard Units. — Standard Units specify in detail the vehicles and appurtenances which may be requisitioned.

S2.2 Standard Permissible Options. — Standard Permissible Options include optional equipment or accessories to be furnished as determined by the purchaser.

S2.3 Justifiable Options. — Justifiable Options include deviations permissible with justification to the activities listed.

S3. Application.—Purchases under the fol-

lowing Federal Specifications, of the issues in effect on the date of invitation for bids, shall be limited to standard units prescribed herein under Standard Permissible Options, Justifiable Options and Standard Units. Existing Government units with other characteristics shall be utilized until exhausted.

Interim Federal Specifications:

KKK-T-00811 (GSA-FSS) — Automobile (100- to 149-Inch Wheelbase).

Federal Specifications:

KKK-A-845—Automobile, Station Wagon, 5-, 6-, or 7-Passenger, 4 x 2.

KKK-A-851—Automobile, Station Wagon, 8-Passenger, 4 x 2.

KKK-T-716—Trucks; Gasoline Engine, Four Wheels—Two Rear Wheel Drive, G.V.W. 4,200 Pounds.

KKK-T-719—Trucks; Gasoline Engine, Four Wheels—Two Rear-Wheel-Drive, G.V.W. 6,400 Pounds.

S4. Options, standard characteristics and item identification.—The standard items with their applicable Federal Stock numbers (FSN) shall conform to the characteristics listed in Standard Units described herein.

JUSTIFIABLE OPTIONS

		JUSTIFICATION NECESSARY
Automobiles, station wagons, and sedan deliveries	8-cylinder engine	Law enforcement and patrol work which requires fast acceleration and top service speeds of 85 miles per hour and over.
Light trucks, carryalls, and sedan deliveries	Engines of over 260 cubic inches displacement, 150 HP and 245 foot-pounds torque	(a) Where 20 percent or more of the operation is off-highway use, or (b) Where operation is at altitudes of 10,000 feet and over.
Light trucks, carryalls, and sedan deliveries	Heavy duty cooling system or specific rear axle ratio	(a) Where operation is desert or equivalent conditions, or (b) Where operation is at altitudes of over 7000 feet. (c) Where vehicle is used primarily as a tow unit.
Light trucks	Ground clearance of 7.7 inches minimum	Where operation is cross country and/or deep rutted roads, when jutting rocks or obstructions which would damage the under-carriage of vehicles are known to exist.
All types vehicles herein	Nylon tires	(a) Law enforcement and patrol work, or (b) Fire fighting, or (c) Ambulance Service, or (d) Where 20 percent or more of the operation is off-highway use.
All types vehicles herein	"No Spin" differential or equal	On icy, muddy, snowy roads or where 20 percent or more of the operation is off-highway use.
All types vehicles herein	Special generators and heavy duty batteries	Where connected load has a demand of over 350 watts, capacities, use and load shall be stated. Agency to specify capacity required of both generator and battery.

STANDARD PERMISSIBLE OPTIONS

Station Wagons	8-cylinder engines
All types vehicles herein	Standard transmission Automatic transmission
Light trucks, sedan deliveries, or carryalls	Tires, tubeless, Tires, with tubes or Tires, mud and snow

STANDARD UNITS

Item No. 1

FSN 2310-554-7168

Automobile; 4-door sedan; 6-passenger; Type I, Class A, in accordance with Interim Federal Specification KKK-A-00811 (GSA-FSS); with 6.40 x 15, 4-ply tires, left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers and painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 2

FSN 2310-541-4516

Automobile; 4-door sedan; 6-passenger; Type I, Class C, in accordance with Interim Federal Specification KKK-A-00811 (GSA-FSS); with 7.50 x 14, 4-ply tires, left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers and painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 3

FSN 2310-541-4518

Automobile; 2-door sedan; 5 and 6 passenger; Type I, Class C, in accordance with Interim Federal Specification KKK-A-00811 (GSA-FSS); with 7.50 x 14, 4-ply tires, left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers, and painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 4

FSN 2310-541-4520

Automobile; coupe or business sedan; 3-passenger; Type I, Class C, in accordance with Interim Federal Specification KKK-A-00811 (GSA-FSS) except that rear ash tray is not required; with 7.50 x 14, 4-ply tires, left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers and painted

any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 5

FSN 2310-541-4522

Station Wagon; 4-door, 8-passenger, Type I, in accordance with Federal Specification KKK-A-851; also equipped with ash trays front and rear, dual constant speed windshield wipers, self-cancelling electrical directional signals front and rear with audible and flashing indicator; left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers, and 8.00 x 14, 6-ply tires; painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 6

FSN 2310-541-4524

Station Wagon; 4-door, 6-passenger, Type III, in accordance with Federal Specification KKK-A-845, with ash trays front and rear, dual constant speed windshield wipers, self-cancelling electrical directional signals front and rear with audible and flashing indicator, left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers, 6.70 x 15 or 7.50 x 14, 6-ply tires and spare tire and wheel, painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 7

FSN 2310-541-4526

Station Wagon; 2-door, 6-passenger; Type III, in accordance with Federal Specification KKK-A-845; with ash trays front and rear, dual constant speed windshield wipers, self-cancelling electrical directional signals front and rear with audible and flashing indicator, left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers, 6.70 x 15 or 7.50 x 14, 6-ply tires and spare tire and wheel; painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 8 FSN 2310-541-4528

Station Wagon; 4-door, Type I, in accordance with Federal Specification KKK-A-851, except that a 6-passenger capacity body will be acceptable; also equipped with ash trays front and rear, dual constant speed windshield wipers, self-cancelling electrical directional signals, front and rear, with audible and flashing indicator; left outside mirror, left front door arm rest, cigar lighter, horn ring, fresh air type heater and defrosters, windshield washers, and 7.50 x 14, 6-ply tires; painted any standard production color or to match any single color of Federal Standard 595 specified on the purchase order.

Item No. 9 FSN 2310-541-4530

Station Wagon; 2-door.—Same as above.

½-TON PICKUP — LIGHT DUTY

Item No. 10 FSN 2320-541-4532

Truck; pickup body; 4200 minimum GVW; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, inside and left outside mirrors, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, rear bumper, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 6.70 x 15, 6-ply tires, and side-mounted spare; painted any standard production color or to match any single color of Federal Standard 595.

½-TON PICKUP — HEAVY DUTY

Item No. 11 FSN 2320-541-4533

Truck; pickup body; 4800 minimum GVW; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, inside and left outside mirrors, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, rear bumper, self-cancelling electrical

directional signals (front and rear) with operator's audible and flashing indicator, 4-speed transmission, 11-inch clutch, rear springs suitable for model offered when carrying 1500 pounds payload, 6.50 x 16, 6-ply truck-type tires, and side-mounted spare; painted any standard production color or to match any single color of Federal Standard 595.

¾-TON PICKUP

Item No. 12 FSN 2320-541-4534

Truck; pickup body; 5600 minimum GVW; 48-inch minimum CA; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, inside and left outside mirrors, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, rear bumper, self-cancelling electrical directional signals (front and rear), with operator's audible and flashing indicator, 4-speed transmission, 11-inch clutch, tires 8-17.5, 6-ply tires, side-mounted spare, painted any standard production color or to match any single color of Federal Standard 595.

1 TON PICKUP — LIGHT DUTY

Item No. 13 FSN 2320-541-4535

Truck; pickup body; 6400 minimum GVW; 58 inch minimum CA; in accordance with Federal Specification KKK-T-719; also equipped with dual constant speed windshield wipers, dual visors, built-in-dash ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, rear bumper, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 8-19.5 6-ply tires; painted any standard production color or to match any single color of Federal Standard 595.

1 TON PICKUP — HEAVY DUTY

Item No. 14 FSN 2320-541-4536

Truck, 9 foot pickup body; 7500 minimum GVW; in accordance with Federal

Specification KKK-T-719; also equipped with dual constant speed windshield wipers, dual visors, built-in-dash ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, rear bumper, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 8-19.5 8-ply tires; painted any standard production color or to match any single color of Federal Standard 595.

½ TON PANEL — LIGHT DUTY

Item No. 15 FSN 2320-541-4537

Truck; panel body; 4200 minimum GVW; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, inside, right and left outside mirrors, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, rear bumper, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 6-ply tires (6.70 x 15); painted any standard production color or to match any single color of Federal Standard 595.

½ TON PANEL — HEAVY DUTY

Item No. 16 FSN 2320-541-4538

Truck; panel body; 4800 minimum GVW; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, inside, right and left outside mirrors, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, self-cancelling electrical directional signals (front and rear), with operator's audible and flashing indicator, 4-speed transmission, 11 inch clutch, rear springs suitable for model offered when carrying 1500 pounds payload, and 6.50 x 16, 6-ply truck-type tires; painted any standard production color or to match any single color of Federal Standard 595.

1 TON PANEL

Item No. 17 FSN 2320-541-4539

Truck; panel body; 6400 minimum GVW; 60 inch minimum CA; in accordance with Federal Specification KKK-T-719; also equipped with dual constant speed windshield wipers, dual sun visors, inside, right and left outside mirrors, built-in-dash ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 8-19.5, 6-ply tires; painted any standard production color or to match any single color of Federal Standard 595.

SEDAN DELIVERY — STANDARD

Item No. 18 FSN 2320-541-4540

Truck; sedan, delivery type; 4100 minimum GVW; 800 pounds approximate load capacity; in accordance with Federal Specification KKK-T-716a except that a 1-pint oil bath air cleaner is acceptable; also equipped with dual constant speed windshield wipers, dual sun visors, inside and left outside mirrors, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, self-cancelling electrical directional signals (front and rear), with operator's audible and flashing indicator, full width split back seat, and 7.50 x 14, 4-ply tires; painted any standard production color or to match any single color of Federal Standard 595.

SEDAN DELIVERY—WITH GLASS SIDE PANELS

Item No. 19 FSN 2320-541-4541

Same as above except also equipped with safety glass window(s) installed in each side panel of body not less than 49 x 12 inches, or equivalent area, for maximum visibility.

CARRYALL — LIGHT DUTY

Item No. 20 { Rear doors FSN 2320-541-4544
 { End gate FSN 2320-541-4545

Truck; carryall; end gate or panel type rear doors (as specified); 8 passenger capacity; removable center and rear seats; 4200 minimum GVW; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, left outside mirror, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 7.10 x 15, 6-ply tires; painted any standard production color or to match any single color of Federal Standard 595.

CARRYALL — HEAVY DUTY

Item No. 21 { Rear doors FSN 2320-541-4542
 { End gate FSN 2320-541-4543

Truck; carryall; end gate or panel type rear doors (as specified); 8 passenger capacity; removable center and rear seats; 4800 minimum GVW; in accordance with Federal Specification KKK-T-716a; also equipped with dual constant speed windshield wipers, dual sun visors, left outside mirror, built-in-dash type ash tray and cigar lighter, fresh air type heater and defrosters, windshield washers, self-cancelling electrical directional signals (front and rear) with operator's audible and flashing indicator, 4-speed transmission, 11 inch clutch, rear springs suitable for model offered when carrying 1500 pounds payload,

and 6.50 x 16, 6-ply truck-type tires, painted any standard production color or to match any single color of Federal Standard 595.

S5. Deviations and changes.—Deviations and changes shall be as follows:

S5.1 Deviations.—This standard is mandatory in all respects. No exceptions to its requirements will be granted for individual or collective purchases. Change in requirement can only be accomplished as prescribed in S5.2.

S5.2 Changes.—When a Federal agency considers that a Federal Standard does not provide for its essential needs, written request for adding to or otherwise changing the standard, supported by adequate justification, shall be sent to the Administration. This justification shall explain wherein the standard does not provide for essential needs. The request shall be sent in duplicate to the General Services Administration, Federal Supply Service, Standardization Division, Washington 25, D. C. The Administration will determine the appropriate action to be taken and will notify the agency.

S6. Conflict with referenced specifications.—Where the requirements specified in this standard conflict with any requirements in a referenced specification, the requirements of the standard shall apply. Nature of conflict between the standard and the referenced specification shall be submitted in duplicate to General Services Administration, Federal Supply Service, Standardization Division, Washington 25, D. C.

Single copies of this standard are available without charge at the GSA Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D. C. Additional copies may be purchased for 10 cents each from the General Services Administration, Business Service Center, Region 3, Seventh and D Streets, SW., Washington 25, D. C.

Fed. Std. No. 119a

JANUARY 19, 1960
(JJ-B-185, Issue in Effect)

SUPERSEDING
Int. Fed. Std. No. 00119 (GSA-FSS)
April 8, 1958

FEDERAL STANDARD**BELT; SEAT, PASSENGER TYPE, AUTOMOTIVE,
METHODS OF INSTALLATION**

Authority.—This standard is issued pursuant to the Federal Property and Administrative Services Act of 1949, as amended, and its application to the purchase of commodities referred to herein is mandatory on all Federal agencies.

S1. Purpose and scope.—This standard establishes the methods for installing passenger seat belts in motor vehicles to achieve the highest degree of uniformity and standardization for the Federal Supply System consistent with the conditions which will be encountered.

S2. Application.—Purchases from commercial sources under Federal Specification JJ-B-185 of the issue in effect on date of invitation for bids, shall be installed in accordance with the applicable method described herein.

S3. Standard characteristics.—The standard methods of installation shall conform to the characteristics listed below:

(a) *General (applicable to all methods)*

1. Installation of seat belts shall be made only after full consideration has been given to the following: The top and underside of the vehicle floor panels or frame members or frame members and panels of storage compartments, in the case of rear seat installation, shall be carefully examined for corrosion or other weakness caused by deterioration, accumulation of moisture or salt air. If there is evidence of excessive corrosion or other weakness

which has or could eventually weaken the structure or sheet metal of the floor or compartment panels, method 1 below, shall not be used and either method 2 or 3 will be acceptable. Periodic inspection shall be made at intervals of not greater than six months to insure that deterioration of the structure has not occurred and to guard against weakening of the attachment structure after installation.

2. The free or attachment ends of belts shall be passed from the front to the rear of the vehicle seat back at the juncture of the seat back and seat cushion. The belt half to which the release mechanism buckle part is attached shall be installed inboard of the opposite belt half to prevent buckle from falling into door opening when belt is not in use. The outboard belt half may pass around the outside of the seat providing no chafing of the belt webbing will result from door movement or other action. The webbing shall be wrapped or threaded to the anchorage as shown in the instructions accompanying the belt. No belt webbing shall be exposed to the weather or

exposed to sharp metal edges when installed. Anchorage brackets shall be aligned so that force applied to the webbing will be distributed across the full webbing width to minimize the possibility of the bracket edge tearing the webbing.

The number of seat belts which shall be installed on one vehicle seat shall be not greater than the number of passengers the seat is designed to normally accommodate. All holes made in the metal of the vehicle for purposes of installation of belts, shall be drilled and shall have all burrs removed. The diameter of a drilled hole shall be not more than $\frac{1}{32}$ -inch larger than the diameter of the bolt or cable it accommodates. Maximum security of anchorage hardware shall be provided for by using special locknuts, standard nuts and locknuts, nuts and lockwashers, drilling and wiring, or upsetting of the bolt threads.

- (b) *Method 1, panel bolted anchorage (with belt webbing threaded directly to point of anchorage or extended by cable to point of anchorage).*—Each of the points of belt anchorage shall be accomplished as shown in figure 1 or 1-a. The location of the anchorages shall be such that when the seat is at the furthest rear position of adjustment, if provided, and the belt is in tension, the belt shall not be inclined at an angle greater than 75° above the horizontal as measured on the forward side of the point of anchorage. The reinforcing plate shall be mounted over the anchorage bolt and shall have the greatest surface feasible of one side bearing upon the outside of the panel.
- (c) *Method 2, frame anchorage (with belt webbing secured indirectly to the frame through a bar and cable).*—Each point of anchorage shall be as shown in figure 2. The bar shall be

secured to a rigid metal member of the seat frame. Hole locations for anchorage shall permit full travel of the seat with the cable tight when the seat is at the furthest point of forward adjustment. This can usually be accomplished by making the cable hand tight when the seat is at the midpoint of travel.

- (d) *Method 3, frame bolted anchorage (with belt webbing secured directly to anchorage bolted through the frame or indirectly through a bar and/or cable to anchorage bolted through the frame).*—Each anchorage shall be as shown in figures 3-a or 3-b. Holes drilled in the frame shall have their centers located at least one diameter from any exposed edge of the frame member. Frame bolted anchorages with belt webbing secured directly to the anchorage (see figure 3-a) shall conform to the requirements of method 1 as to location with respect to the vehicle seat. Frame bolted anchorages with belt webbing secured indirectly through a bar and/or cable (see figure 3-b) shall conform to the requirements of method 2 and the anchorage bolt shall pass through the floor panel and a frame member. No reinforcing plate is required.

S4. Changes.—When a Federal agency considers that a Federal Standard does not provide for its essential needs, written request for adding to or otherwise changing the standard, supported by adequate justification, shall be sent to the Administration. This justification shall explain wherein the standard does not provide for essential needs. The request shall be sent in duplicate to the General Services Administration, Federal Supply Service, Standardization Division, Washington 25, D. C. The Administration will determine the appropriate action to be taken and will notify the agency.

S5. Conflict with referenced specifications.—Where the requirements specified in this

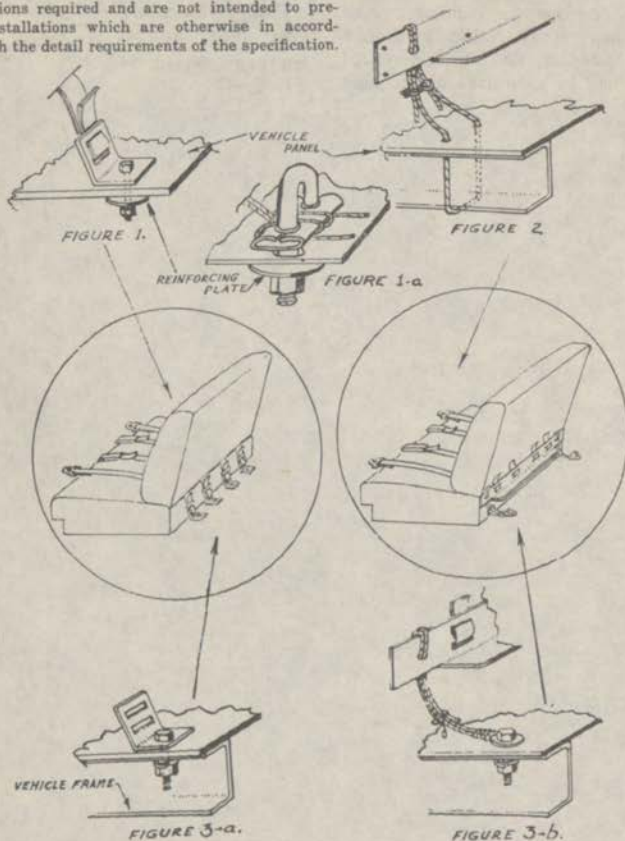
standard conflict with any requirements in a referenced specification, the requirements of the standard shall apply. Nature of conflict between the standard and the referenced specification shall be submitted in duplicate

to the General Services Administration, Federal Supply Service, Standardization Division, Washington 25, D. C.

MILITARY INTERESTS:

Navy—Y.

Note.—Figures illustrate general design of typical installations required and are not intended to preclude installations which are otherwise in accordance with the detail requirements of the specification.



Single copies of this standard are available without charge at the GSA Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D. C. Additional copies may be purchased for 5 cents each from the General Services Administration, Business Service Center, Washington 25, D. C.

JJ-B-185a

JANUARY 19, 1960

SUPERSEDING

Int. Fed. Spec. JJ-B-00185 (GSA-FSS)

April 8, 1958

FEDERAL SPECIFICATION

BELT; SEAT, PASSENGER TYPE, AUTOMOTIVE

This specification was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE AND CLASSIFICATION

1.1 Scope.—This specification covers requirements for automotive, passenger type seat belts, complete with necessary component parts for installation in motor vehicles having covered, rigid, passenger and operator compartments.

1.2 Classification.

1.2.1 Types and styles.—Seat belts furnished under this specification shall be of the following types and styles as specified (see 6.1):

Type I.—Front seat installation

Type II.—Rear seat installation

Style 1.—One belt

Style 2.—Two belt

Style 3.—Three belt

2. APPLICABLE SPECIFICATIONS, STANDARDS, AND OTHER PUBLICATIONS

2.1 Specifications and standards.—The following specifications and standards, of the issues in effect on date of invitation for bids, form a part of this specification.

Federal Specification:

CCC-T-191—Textile Test Methods.

Federal Standards:

Federal Standard No. 102—Preservation, Packaging, and Packing Levels.

Federal Standard No. 119—Belts; Seat, Passenger Type, Automotive, Methods of Installation.

Federal Standard No. 123—Marking for Domestic Shipment (Civilian Agencies).

Federal Standard No. 751 — Stitches, Seams, and Stitchings.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards, and Handbooks as outlined under General Information in the Index of Federal Specifications, Standards, and Handbooks and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D. C.)

(Federal Government activities may obtain copies of Federal Specifications, Standards, and Handbooks and the Index of Federal Specifications, Standards, and Handbooks from established distribution points in their agencies.)

Military Specifications:

MIL-T-7807—Thread, Nylon.

Military Standards:

MIL-STD-105 — Sampling Procedures and Tables for Inspection by Attributes.

MIL-STD-129—Marking for Shipment and Storage.

(Copies of Military Specifications and Standards required by contractors in connection with specific

procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications.—The following publication of the issue in effect on date of invitation for bids, forms a part of this specification:

*American Society for Testing Materials
Publication:*

ASTM B-117-54T Method of Salt
Spray (Fog) Testing, Tentative

(Copies of ASTM Standards may be obtained upon application to American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.)

3. REQUIREMENTS

3.1 Qualification.—Seat belts furnished under this specification shall be a product which has been tested and approved in accordance with the qualification tests described in section 4. (See 4.3.4 and 6.3.)

3.2 Materials.—All metals shall be of a corrosion resisting type or protected to resist corrosion as required in 3.3.5 and 3.4.5.

3.3 Design and construction.

3.3.1 General.—The seat belts shall be designed for single occupancy. No rivets shall be used in the belt webbing. Each belt end shall be attached to an individual anchorage, except that center belt of types I and II, style 3, may have each of its belt ends attached to a common anchorage with the adjacent belt end. When the belts are secured indirectly through a bar and cable, each point on the bar through which a single belt is threaded or wrapped shall be considered an individual anchorage. Belts shall be designed to be attached directly to the point of anchorage as shown for a two occupant installation in figure 4 or the belts shall be secured indirectly to the point of anchorage through a bar and/or cable as shown for a two occupant installation in figure 5. The ultimate anchorage with a bar and cable shall be around or through a substantial vehicle frame member and not more than three belt ends may be supported by each of these anchorages. (See 3.4.2.)

3.3.2 Webbing.—Webbing used in the belts shall be of woven nylon, "Dacron", nylon and "Dacron", or nylon and rayon, and $1\frac{1}{16}$ to $2\frac{1}{16}$ inches wide under no load. The finished length of webbing on type I belts shall be such that at greatest length adjustment with buckle latched and webbing ends threaded to attachment hardware in accordance with manufacturers instructions, the overall length of the belt assembly shall be not less than 78 inches. Webbing lengths may be less than specified when ends of webbing are extended by cables to point of anchorage and webbing lengths in this instance shall be sufficient to assure that when belts are installed the webbing end fittings shall remain hidden between seat cushion and seat back. Type II, rear seat, and bar and cable belt webbing may be less than the above lengths by 10 inches for each belt half. Provision shall be made with metal to metal type buckles to prevent the adjustable belt end from pulling out of the buckle. Cut ends of webbing shall be treated to prevent raveling.

3.3.2.1 Color.—Webbing color shall be as specified in bid invitations. Colors and dye stuffs used shall not cause deterioration or damage to weaken the fibers of seat belts under normal storage or use conditions.

3.3.3 Sewing.—Sewing used on webbing shall be with 7 to 9 stitches per inch in accordance with Federal Standard No. 751, type 301.

3.3.3.1 Thread.—The thread used for sewing shall be three-cord nylon, machine twist or twisted nylon polymer bonded multicord, low-stretch, with maximum elongation of 22 percent (see 4.4.7). The thread shall be made from bright, high tenacity, continuous filament nylon yarn. (See 6.5.)

3.3.4 Hardware.

3.3.4.1 Buckles.—The buckle shall be a metal to metal type with a positive latch or a metal to webbing type designed to lock by friction at any desired place on the webbing.

The metal to metal buckle shall have a friction type length adjustment on at least one side which shall not require that the buckle be released to adjust the belt length. Buckles shall be capable of being released with either hand.

3.3.4.2 Attachment hardware.—The belts shall be furnished complete with suitable hardware and fittings to permit installation in a vehicle in accordance with Federal Standard No. 119.

3.3.4.3 Panel-bolted anchorage.—An anchorage designed to be bolted through a vehicle panel only shall be secured through a formed steel plate similar to that shown in figure 4-a, an eye bolt, or a "U" bolt. Panels shall include metal floors, wheel wells and rigid, fixed, metal parts other than seat parts.

3.3.4.3.1 Reinforcing plate.—The panel bolted anchorage shall have a flat steel reinforcing plate, see figure 4-a, at least $\frac{1}{16}$ -inch thick by 4 square inches in area with the bolt hole located at the center. "U" bolt plates shall have holes located as required. Rectangular plate corners shall be removed or rounded. The plate may be continuous between anchorages and may also be embossed or otherwise reinforced on one side.

3.3.4.4 Frame anchorage.—An anchorage designed to be secured to a vehicle frame member by a cable around the member shall be similar to that shown in figure 5-a. The cable shall be of one piece fastened by at least two "U" bolt cable clamps equipped with nuts and lockwashers.

3.3.4.5 Frame-bolted anchorage.—An anchorage designed to be bolted through a frame member of the vehicle shall be secured through a formed steel plate similar to that shown in figure 4-b, an eye bolt, or a "U" bolt, or through a cable loop similar to that shown in figure 5-b. A cable loop passing around the anchorage bolt shall be served with wire or clamped by metal to prevent its slipping over the bolt head and there shall be a reinforcing plate at least $\frac{1}{16}$ inch thick by $1\frac{1}{4}$ inches in

diameter directly between the bolt head and the cable loop.

3.3.4.6 Belt anchorage bar.—The bar provided with belts designed to be secured indirectly to the point of anchorage as shown in figure 5, shall have provision for securing to a rigid metal member of the seat frame. The bar shall not extend beyond the edges of the seat and exposed corners shall be rounded and have all sharp edges removed.

3.3.5 Finish of metal parts.—All metal parts shall be free from burrs and sharp edges and shall be of a corrosion resistant material or finished to prevent corrosion with plating, anodizing or a baked enamel. (See 3.4.5 for corrosion resistance of exterior metal parts.)

3.4 Performance.

3.4.1 Webbing.

3.4.1.1 Breaking strength.—The breaking strength of the webbing used in the belts shall be not less than 4000 pounds when tested as specified in 4.4.2.1.

3.4.1.2 Elongation.—Elongation of webbing shall not exceed 25 percent under a 2500-pound load when tested as specified in 4.4.2.1.

3.4.1.3 Colorfastness.—Colorfastness of webbing used in seat belts shall be at least "Fair" to light and laundering when tested as specified in 4.4.2.2 and 4.4.2.3, respectively.

3.4.1.4 Abrasion resistance.—After the webbing is subjected to the abrasion specified in 4.4.2.4, the breaking strength shall be not less than 90 percent of the breaking strength given in 3.4.1.1.

3.4.2 Tensile strength, common anchorages.—Belt assembly parts used for each common anchorage as described in 3.3.1 shall withstand without failure a load equal to the number of belt ends anchored times 2500 pounds for 3 seconds when tested as set forth in 4.4.3.

3.4.3 Loop strength, (each occupant) belt assembly.—When tested as specified in 4.4.4, the assembled belt shall withstand a minimum loop load of not less than 5000 pounds applied for 3 seconds. The release mechanism of the buckle shall be operable after this test. Damage, such as broken sewing thread without complete separation, broken or frayed webbing without complete separation of the webbing, deformation but not rupture of the hardware or metal parts, is permitted. Total slippage of webbing through the adjusting device or attachment hardware shall not exceed 1 inch.

3.4.4 Buckles.

3.4.4.1 Release mechanism, under load.—When tested in accordance with 4.4.5.1 the force required to open the buckle shall not exceed 45 pounds.

3.4.4.2 Release and latching mechanism, under no load.—When tested as specified in 4.4.5.2, the movement, by hand, of buckle release and latching parts through their maximum travel shall not produce any galling or wearing of buckle parts, cause any failure or malfunction, or change buckle unlatching force by more than 5 percent.

3.4.5 Corrosion resistance, exterior metal parts.—All metal parts of the belt assembly intended to be installed through or outside of the passenger and operator compartments of a vehicle shall be capable of completing the tests specified in 4.4.6 without corrosion.

3.5 Instructions.—Each belt assembly shall be furnished with printed instructions which clearly and concisely set forth installation directions, including anchor mounting instructions, location and dimensions for mounting, threading of webbing between cushion and back of seat, wrapping of webbing at attachments, reinforcing of floor; general directions for use, cleaning, cautions to installer as to sharp or rough edges and warnings against bleaching or dyeing. To emphasize and clarify wrapping of webbing at attachment hard-

ware, the instructions shall include schematic or other clearly understood drawings depicting the proper method to be used.

3.6 Marking.—Each half of the belt assembly shall be permanently marked to provide identification of the manufacturer and belt model.

4. SAMPLING, INSPECTION, AND TEST PROCEDURES

4.1 Inspection lot.—All belts and attachments of one type and style offered at one time shall be considered a lot for purposes of acceptance, inspection, and tests.

4.2 Sampling.

4.2.1 Design and construction inspection.—A random sample of complete belts with attachments shall be selected from each lot offered for inspection of design and construction characteristics in accordance with Military Standard MIL-STD-105, inspection level L-4.

4.2.1.1 Thread.—Not less than 75 feet of sewing thread in lengths not less than 3 feet shall be selected from each lot of material used in the manufacture of the seat belts offered for inspection. This thread shall be used to conduct the thread elongation test specified in 4.4.7.

4.2.2 Visual inspection.—A random sample of complete belts with attachments shall be selected from each lot offered for inspection of visual characteristics in accordance with Military Standard MIL-STD-105 at inspection level II.

4.2.3 Lot tests.—Two sets of random samples of complete belts with attachments shall be selected from each inspection lot. The samples shall be selected in accordance with Military Standard MIL-STD-105, inspection level L-4.

4.2.4 Qualification tests.—The manufacturer shall submit the following from his regular production for qualification testing:

- (a) Six complete assemblies of seat belts, including attachments, of each type and style to be qualified.
- (b) One-fourth pound of thread, on spool, as used for stitching of the belts.

compliance with the design and construction characteristics (see 3.3) of this specification, applicable specifications or referenced standards. Any deviation therefrom shall constitute a defect and one or more defects shall cause rejection of the lot.

4.3 Inspection and tests.

4.3.1 *Design and construction inspection.*—Each specimen in the samples selected in accordance with 4.2.1 shall be inspected for

4.3.2 *Visual inspection.*—Each specimen of the sample selected in accordance with 4.2.2 shall be examined for defects in finish, construction, workmanship and marking:

Examine	Defects	Classification		
		Critical	Major	Minor
Webbing	Cut, hole or tear, any -----	X		
	Spliced or patched -----		X	
	Broken threads—two or more in one belt half -----	X		
	Missing chafing strip, where required -----	X		
	Untreated cut end -----			X
	Ravel on treated cut end—one -----			X
	Color:			
	Dye streak -----			X
	Spot or stain -----			X
	Abrasion mark -----		X	
Stitching ¹	Stitch tension:			
	Loose tension resulting in loosely secured webbing -----	X		
	Tight tension resulting in webbing pucker -----		X	
	Open stitching:			
	One broken stitch -----		X	
	Two or more broken stitches -----	X		
	Two skipped stitches -----		X	
	More than two skipped stitches -----	X		
Hardware	¹ Defects listed shall be classified as minor on nonload bearing stitching such as at free end of webbing.		X	
	Missing lock nut, lock washer, bolt or washer -----			X
	Missing—cable clamp, reinforcing plate or webbing attachment -----		X	
	Corrosion resistance not provided for hardware item intended for exterior application -----		X	
	Corrosion resistance missing from part intended for interior application -----			X
	Burr or sharp edge on attachment hardware part against which webbing will bear -----		X	
Installation instructions	Missing or incomplete -----		X	
Marking	Missing from one belt half -----			X
	Missing from both belt halves -----		X	

4.3.2.1 Acceptable quality levels (AQL's).

—The acceptable quality levels for the visual inspection expressed in defects per hundred units shall be as follows:

Defect	AQL
Critical -----	0.1
Major -----	1.5
Total -----	4.0

4.3.3 Lot tests.—Each specimen of one random sample set selected in accordance with 4.2.3, shall be tested as specified in 4.4.4 and 4.4.5.1. Webbing and hardware specimens shall be taken from the second random sample set to be tested as specified in 4.4.2.1, 4.4.2.2, 4.4.2.3, 4.4.2.4, 4.4.3, 4.4.5.2 and 4.4.6. The number of specimens of webbing and hardware to be subjected to each test shall be equal to the number of belts in one random sample set. Failure of any specimen to pass the tests specified shall cause rejection of the lot represented by the specimen.

4.3.4 Qualification tests.—Qualification tests shall consist of the design and construction inspection, the visual inspection, and the tests specified in 4.4. All belts submitted in accordance with 4.2.4 shall first be inspected in accordance with 4.3.1 and 4.3.2. Three of the belts submitted shall then be tested as specified in 4.4.4 and 4.4.5.1. Webbing and hardware test specimens shall be taken from the remaining three belts and three each of such test specimens shall be tested as specified in 4.4.2.1, 4.4.2.2, 4.4.2.3, 4.4.2.4, 4.4.3, 4.4.5.2, and 4.4.6. Tests for qualification shall be conducted at a Government laboratory or a commercial testing laboratory approved by the Standardization Division, Federal Supply Service, General Services Administration. Approval of a commercial testing laboratory for qualification testing shall be obtained from the Standardization Division prior to the tests. Application for approval shall include the following information:

- (1) Name and location of laboratory.
- (2) Extent of laboratory's experience in the testing of this and other products.

(3) Statement that laboratory is equipped to make the tests listed above. At the conclusion of the qualification tests in an approved commercial laboratory, copies of the test report certified by an executive of the manufacturing concern, shall be submitted to the General Services Administration, FSS, Standardization Division.

4.4 Test procedures.

4.4.1 General.—Tests shall be conducted under prevailing atmospheric conditions.

4.4.2 Webbing tests.

4.4.2.1 Breaking strength and elongation.—Specimens of webbing used in the belts, shall be subjected to the following test: The specimens shall be mounted in a testing machine when the heads are 10 inches apart and the heads shall separate at the rate of 4 inches per minute maximum under no-load. Each test specimen of the webbing shall withstand a load at least equal to the minimum breaking strength specified in 3.4.1.1 for at least three seconds without failure. Elongation shall be determined while webbing is loaded as specified in 3.4.1.2.

4.4.2.2 Color fastness to light.—Specimens of webbing shall be exposed for 20 Standard Fading Hours, as specified in method 5660 of Federal Specification CCC-T-191, to determine compliance with the requirements of 3.4.1.3.

4.4.2.3 Color fastness to laundering.—The webbing shall be tested in accordance with method 5614 of Federal Specification CCC-T-191, to determine compliance with the requirements of 3.4.1.3.

4.4.2.4 Abrasion resistance.—The webbing shall be tested for abrasion resistance on the device shown schematically in figure 3. The webbing shall have a 5.2 pound \pm 2 ounce weight attached to one end and the webbing

shall pass over a hexagonal bar and be attached to the oscillating drum. The drum shall oscillate so that the webbing is given a 13 inch traverse over the bar at the rate of 60 ± 2 strokes per minute. After 5000 strokes, the webbing shall be removed and the breaking strength ascertained by testing as described in 4.4.2, to determine compliance with 3.4.1.4

4.4.3 Tensile strength test, common anchorage.—Specimens of each part of the belt assembly designed as a common anchorage shall be subjected to the load given in 3.4.2. The anchorage assembly shall be attached between the heads of the testing machine as described in 4.4.2. The manner of attachment shall assure that all parts of the assembly are subjected to the load specified and that insofar as practical the manner of attachment shall be the same as when the parts are installed in a vehicle. Pieces of webbing or other suitable items shall be substituted for complete belts in this test.

4.4.4 Loop strength test, belt assembly.—Specimens of the belt assembly shall be tested to determine the loop strength. The belt assembly shall be attached in the testing machine in a manner which will assure that all parts of the assembly are subjected to the load specified. It is intended that attachment to the heads of the testing machine shall simulate insofar as practicable the method of attachment to be used when the belt is installed in a vehicle. The belt assembly shall be attached in the testing machine basically as shown in figure 1. (The belt ends shall be adjusted at the attachment points so that the buckle is midway of the overall length of the belt loop). The buckle shall be closed with the belt passed over the test block. The test block shall be of a material, such as wood, which will not be deformed appreciably by the test load. The dimensions of the block shall be as shown in figure 2. The surface of the block on which the belt bears shall be padded with not more than a 1 inch thickness of medium density sponge rubber covered with a fabric

to simulate normal clothing. The heads of the testing machine shall separate at the rate of 4 inches per minute maximum under no load. Load shall be applied until the testing machine indicates the load specified in 3.4.3. (Examination of the belt for compliance with 3.4.3, shall be withheld until completion of the test described below in 4.4.5.1.)

4.4.5 Buckle tests.

4.4.5.1 Release mechanism, under load.—This test shall be a continuation of the test in 4.4.4. The load on the testing machine shall be reduced from the 5000 pounds required in 4.4.4 to 100 pounds, which shall be held during this test. The release mechanism of the buckle shall then be operable at no more than a 45-pound force. The load shall be removed and the belt examined for compliance with the requirements of 3.4.3.

4.4.5.2 Release and latching mechanism, under no load.—Specimens of buckle parts which incorporate the release and latching mechanisms, with webbing in place, shall be attached or firmly held against a plane surface so as to permit movement of parts through their full travel. The force to move the buckle release from the latched position shall be measured. Then with metal mating plate (metal to metal buckles) or webbing end (metal to webbing buckles) withdrawn from buckle, the release mechanism shall be moved by hand through the maximum possible travel 200 times at a rate not to exceed 30 cycles per minute. The force to move the buckle release from the latched position shall again be measured and the buckle examined to determine compliance with the performance requirements of 3.4.4.2.

4.4.6 Corrosion-resistance test.—Exterior metal parts of the belt assembly shall be subjected to a salt spray (fog) test in accordance with ASTM-B-117-54T for a period of 50 hours, consisting of two periods of 24 hours exposure and one hour drying time each. Immediately after completion of this exposure

and drying, the parts shall be examined for compliance with the requirements of 3.4.5.

4.4.7 Thread elongation test.—When tested as specified in method 4102 of Federal Specification CCC-T-191 the percent elongation of the thread at break, shall not exceed the value stated in 3.3.3.1.

5. PREPARATION FOR DELIVERY

5.1 For civil agency procurement the levels of preservation, packaging, and packing used are defined in Federal Standard No. 102.

5.1.1 Packaging.

5.1.1.1 Levels A, B, and C.—Belts shall be individually packaged with all necessary hardware and attachments for each style and shall conform to manufacturer's standard practice.

5.1.2 Packing.

5.1.2.1 Levels A, B, and C.—Belts shall be packed in standard commercial containers, so constructed as to insure acceptance by common or other carrier for safe transportation at the lowest applicable rate to the point of delivery.

5.2 Marking.

5.2.1 Civil agencies.—Shipping containers shall be marked in accordance with Federal Standard No. 123.

5.2.2 Military agencies.—Shipping containers shall be marked in accordance with Military Standard MIL-STD-129.

6. NOTES

6.1 Ordering data.—Purchasers should exercise any desired options offered herein and procurement documents should specify the following:

- (a) Title, symbol, and date of this specification

- (b) Type (see 1.2.1)

- (c) Style (see 1.2.1)

- (d) Color (see 3.3.2.1)

- (e) Limitation in methods of attachment, where justified (see Federal Standard No. 119, paragraph S3 (a) 1.)

- (f) Level of packaging and packing required (5.1.1 and 5.1.2)

6.2 Intended use.—The automotive seat belts covered by this specification are intended for use in motor vehicles as an aid in reducing injuries and accidental deaths resulting from accidents.

6.3 In the procurement of products requiring qualification, the right is reserved to reject bids on products that have not been subjected to the required tests and found satisfactory for inclusion on the Qualified Products List. The attention of suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products covered by this specification may be obtained from the Standardization Division, Federal Supply Service, General Services Administration, Washington 25, D. C.

6.4 Transportation description.—Transportation description applicable to this item is:

Belts not otherwise indexed by name, other than chain belts.

Carload minimum weight 30,000 pounds.

Belts not otherwise indexed.

Motor volume minimum weight 30,000 pounds, subject to Rule 34, National Motor Freight Classification.

6.5 Nylon thread, types I or II, class 1, as covered by Military Specification MIL-T-

7807, meets the requirements specified in 3.3.3.1.

6.6 "Dacron" is the registered trademark of the E.I. DuPont deNemours Corp. for a polyester fiber.

Notice. — When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Govern-

ment may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded, by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

MILITARY CUSTODIANS:

Army—Ordnance Corps

Navy—Bureau of Yards and Docks

Air Force.

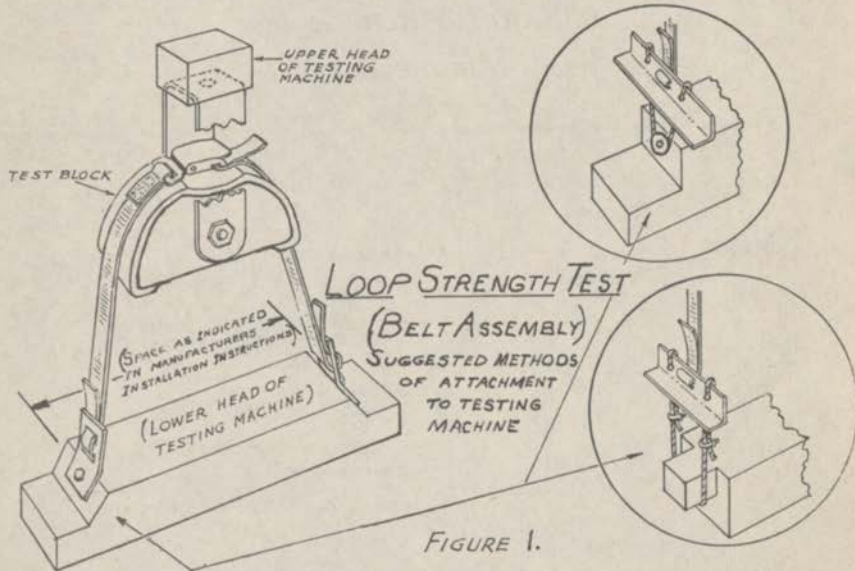
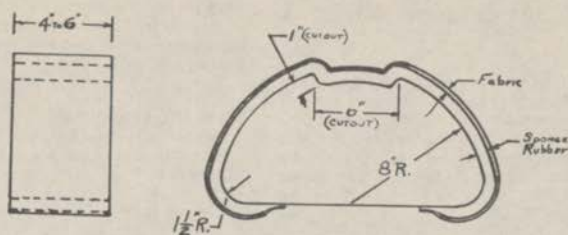
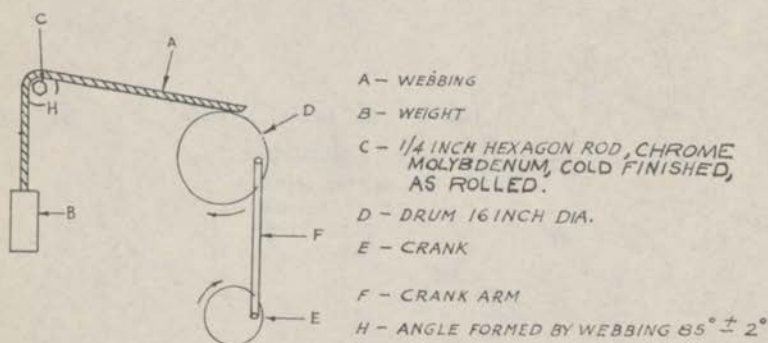


FIGURE 1.



TEST BLOCK
FOR LOOP STRENGTH TEST
FIGURE 2.



ABRASION TEST
FIGURE 3

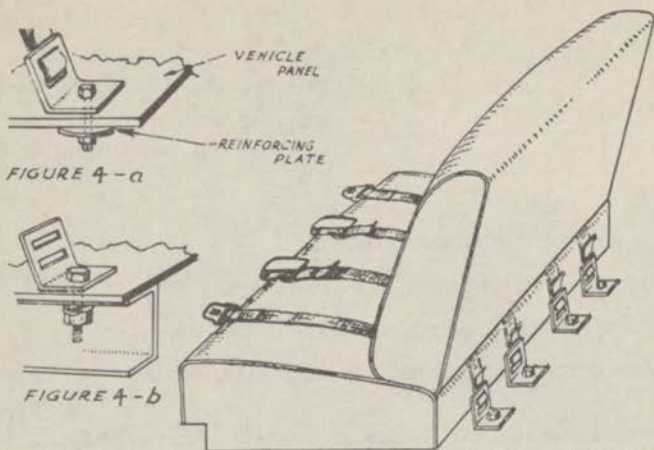


FIGURE 4.

NOTE: Figures illustrate general design of typical installations required and are not intended to preclude installations which are otherwise in accordance with the detail requirements of the specification.

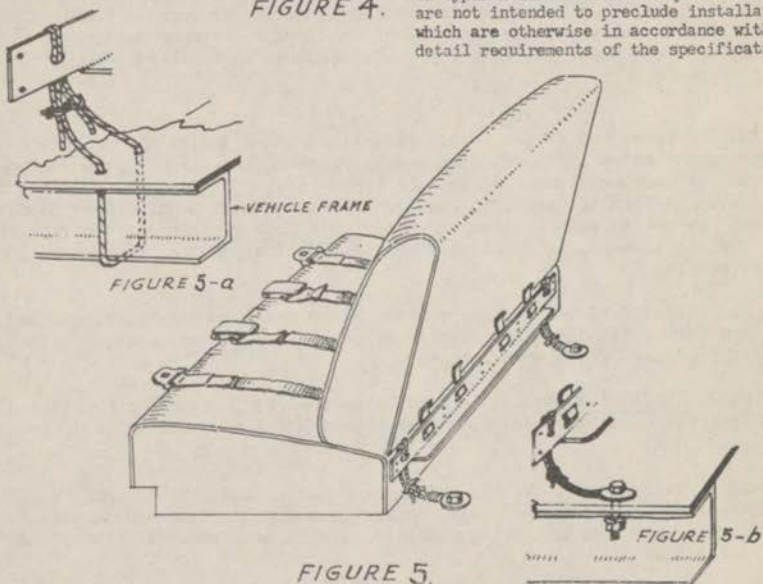


FIGURE 5.

Int. Fed. Std. No. 00122c(GSA-FSS)
January 1, 1961
Revision of
Int. Fed. Std. No. 00122b(GSA-FSS),
October 13, 1959

INTERIM FEDERAL STANDARD

AUTOMOBILES, STATION WAGONS, AND LIGHT TRUCKS;

STANDARD UNITS, STANDARD PERMISSIBLE OPTIONS,

JUSTIFIABLE OPTIONS AND STANDARD LAW ENFORCEMENT OPTIONS

This Interim Federal Standard will become effective January 1, 1961. It was developed by Standardization Division, Federal Supply Service, General Services Administration, Washington 25, D. C., based upon currently available technical information. It is recommended that Federal agencies use it in procurement and forward recommendations for changes to the preparing activity at the address shown above.

S1. Purpose and scope. - This Federal Standard limits the procurement of Government automobiles, station wagons, certain light trucks, and carryalls to the smallest number of vehicle types (and appurtenances) required to adequately perform the services required. These standard units have been adopted for use in consolidated purchases to afford vehicles of the type and weight-class covered, procured with shortest delivery dates, at the lowest prices obtainable.

S2. Classification. - Equipment standardized hereunder is classified as Standard Units; Standard Justifiable Options; Standard Permissible Options; and Standard Law Enforcement Options.

S2.1 Standard Units. - Standard Units specify in detail the vehicles and appurtenances (accessories and equipment) which may be requisitioned (see table IV).

S2.2 Standard Justifiable Options. - Justifiable Options include deviations from the Standard Unit, permissible for the intended service or application when substantiating justification is submitted with the requisition (see table I).

Int. Fed. Std. No. 00122c(GSA-FSS)

S2.3 Standard Permissible Options. - Permissible Options include optional equipment or accessories to be furnished with Standard Units, as determined by the using activity (see table II).

S2.4 Standard Law Enforcement Options. - Standard Law Enforcement Options include special equipment required for law enforcement activities. These options are limited to the equipment provided for in the agency's legislative authority (see table III).

S3. Application. - Purchases of vehicle types covered by the items of table IV shall be limited to the Standard Units prescribed therein or as modified by the Standard Justifiable Options, Permissible Options and Law Enforcement Options, as applicable. Except as modified herein, the items are to be as specified by the latest issue in effect of the following specifications and standards:

Interim Federal Specifications:

KKK-A-00811(GSA-FSS) - Automobile (100- to 149-Inch Wheelbase).
KKK-A-00850(GSA-FSS) - Automobile, Station Wagon, (4x2, 100- To 118-Inch Wheelbase).
KKK-T-00723(GSA-FSS) - Truck, (Gasoline Engine, 4x2, 4,000 To 10,000 Pounds G.V.W.).

Federal Standard:

Fed. Std. No. 595 - Colors.

(Activities outside the Federal Government may obtain copies of Federal Specifications, Standards and Handbooks as outlined under General Information in the Index of Federal Specifications, Standards and Handbooks and at the prices indicated in the Index. The Index, which includes cumulative monthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

(Single copies of this specification and other product specifications required by activities outside the Federal Government for bidding purposes are available without charge at the General Services Administration Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D. C.

(Federal Government activities may obtain copies of Federal Specifications, Standards and Handbooks and the Index of Federal Specifications, Standards and Handbooks from established distribution points in their agencies.)

Military Specifications:

MIL-S-10379 - Suppression, Radio Interference General Requirements for Vehicles (and Vehicular Subassemblies).

(Copies of military specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

Int. Fed. Std. No. 00122c(GSA-FSS)

54. Standard Options and Standard Units.

54.1 Standard Options. - Standard Justifiable Options, Law Enforcement Options and the justification required, and Permissible Options shall be as itemized in tables I, II, and III.

54.2 Standard Units. - Standard Units with their applicable Federal Stock Numbers (FSN) shall be requisitioned as listed in table IV under items 1 through 70.

Table I. - Justifiable options - (for all agencies when justified).

Vehicle	Option	Justification necessary
Trucks, carryalls, and sedan deliveries - Items 21 thru 23; 32 & 33; 40 thru 42; 50 thru 53; 62 & 70.	Engine of minimum 259-cubic inch displacement, 150 hp., and 235 ft./lb. torque	(a) Where 20 percent or more of the operation is off-highway use, or (b) Where operation is at altitudes of 10,000 feet and over.
Sedans - Items 2, 3, and 4.	8-cylinder engine	(a) Law enforcement vehicle. (b) For vehicles with automatic transmissions if 20 percent or more of operation is on 8 percent grade in mountain terrain.
All types vehicles herein.	Heavy duty cooling system	(a) Where operation is desert or equivalent conditions; (b) Where operation is at altitudes of over 6,500 feet; (c) Where vehicle is used primarily as a tow unit, or (d) Where operation is in ambient air temperatures at 125°F.
All types vehicles herein.	40-amp. generator or 50-amp. alternator	Where connected load has a demand of over 350 watts, use and load shall be stated.

Int. Fed. Std. No. 00122c(GSA-FSS)

Table I. - Justifiable options - (for all agencies when justified), cont'd.

Vehicle	Option	Justification necessary
All types vehicles herein.	Mylon tires	(a) Fire fighting; (b) Ambulance service; (c) Where 20 percent or more of operation is off-highway use; (d) Law enforcement
All vehicles	Overseas package for export	Where mandatory for legal vehicle operation.

Table II. - Standard permissible options - (permissible to all agencies except as indicated in table*)

Vehicle	Option
Station wagons (items 12, 13, and 14)	8-cylinder engines.
All types vehicles herein	Standard transmission. Automatic transmission.
Light trucks; sedan deliveries; or carryalls (items 20 thru 23; 30 thru 33; 40 thru 42; 50 thru 53; 60 thru 62; and 70)	Tires, tubeless; Tires with tubes; or Tires, mud and snow.
All vehicles herein	Painted any single standard production color or to match any color of Fed. Std. No. 595.
All types vehicles herein	Special traction differential (Int. Fed. Spec. KKK-D-00350a(GSA-FSS)).
Sedan deliveries (item 62)	8.00 X 14, 6-ply tires; Heavy duty rear springs.
All vehicles herein	Seat belts.
Item 21	6.70 X 15, 4-ply tires; Rear bumpers.

Int. Fed. Std. No. 00122c(GSA-FSS)

Table II. - Standard permissible options - (cont'd)

Vehicle	Option
Items 21, 32, 50 and 70	Four-speed transmission.
All types vehicles herein	Undercoating.
*For Department of Defense only, all nontactical vehicles	Radio-interference suppression in accordance with Military Specification MIL-S-10379.

Table III. - Law enforcement options - (permissible to agencies to the extent provided for in their legislative authority)

Vehicle	Option
Sedans, station wagons and sedan deliveries - (items 2, 3, 4, 12, 13, 14 and 62)	Special tires and tubes. Low cut-in generator - 40 ampere. Low cut-in alternators - 50 ampere. High performance engine - 300 hp., minimum. Special paint. Padded visors and dashboards. Heavy duty police-type seats with vinyl or equal upholstery. Heavy springs and shock absorbers. Heavy duty cooling system. Built-in radio antenna. Flasher light and special switches. Power brakes. Power steering. Radio-interference suppression as specified.

Int. Fed. Std. No. 00122c(GSA-FSS)

Table IV. - Standard units

4-DOOR SEDAN	
Item No. 1	FSN
Automobile; 4-door sedan; Type I; in accordance with Int. Fed. Spec. KKK-A-00811(GSA-FSS), equipped with: 6.00 X 15, 4-ply tires, minimum; 6.50 X 13, 4-ply tires, minimum; heater and defrosters, fresh air type; 40-amp. hour minimum battery.	
4-DOOR SEDAN	
Item No. 2	FSN
Automobile; 4-door sedan; Type II; in accordance with Int. Fed. Spec. KKK-A-00811(GSA-FSS), equipped with: 6.70 X 15, 4-ply tires, minimum; or 7.50 X 14, 4-ply tires, minimum; heater and defrosters, fresh air type; 70-amp. hour minimum battery.	
2-DOOR SEDAN	
Item No. 3	FSN
Automobile; 2-door sedan; Type II; in accordance with Int. Fed. Spec. KKK-A-00811(GSA-FSS), equipped with: 6.70 X 15, 4-ply tires, minimum; or 7.50 X 14, 4-ply tires, minimum; heater and defrosters, fresh air type; 70-amp. hour minimum battery.	
COUPE OR BUSINESS SEDAN	
Item No. 4	FSN
Automobile; coupe or business sedan; Type II; in accordance with Int. Fed. Spec. KKK-A-00811(GSA-FSS), equipped with: 6.70 X 15, 4-ply tires, minimum; or 7.50 X 14, 4-ply tires, minimum; heater and defrosters, fresh air type; 70-amp. hour minimum battery.	

Int. Fed. Std. No. 00122c(GSA-FSS)

2-DOOR STATION WAGON

Item No. 10

FSN

Station wagon; 2-door;
Type I; in accordance with Int. Fed. Spec.
KKK-A-00850(GSA-FSS); 100-inch minimum
wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
6.70 X 15, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

4-DOOR STATION WAGON

Item No. 11

FSN

Station wagon; 4-door;
Type II; in accordance with Int. Fed. Spec.
KKK-A-00850(GSA-FSS); 100-inch minimum
wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
6.70 X 15, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

4-DOOR STATION WAGON

Item No. 12

FSN

Station wagon; 4-door;
Type III; in accordance with Int. Fed. Spec.
KKK-A-00850(GSA-FSS); 108-inch minimum
wheelbase; equipped with:
6.70 X 15, 6-ply tires, minimum;
7.50 X 14, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

4-DOOR STATION WAGON

Item No. 13

FSN

Station wagon; 4-door;
Type IV; in accordance with Int. Fed. Spec.
KKK-A-00850(GSA-FSS); 118-inch minimum
wheelbase; equipped with:
8.00 X 14, 6-ply tires, minimum
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

Int. Fed. Std. No. 00122c(GSA-FSS)

4-DOOR STATION WAGON

Item No. 14

FSN

Station wagon; 4-door;
Type V; in accordance with Int. Fed. Spec.
KKK-A-00850(GSA-FSS); 118-inch minimum
wheelbase; equipped with:
8.00 X 14, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

1/2 TON PICKUP (FORWARD CONTROL)

Item No. 20

FSN

Truck; pickup body;
Type I; 4000 minimum GVW; in accordance
with Int. Fed. Spec. KKK-T-00723(GSA-FSS);
90-inch minimum wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

1/2 TON PICKUP

Item No. 21

FSN

Truck; pickup body;
Type IV; 4800 minimum GVW; in accordance
with Int. Fed. Spec. KKK-T-00723(GSA-FSS);
110-inch minimum wheelbase; equipped with:
6.50 X 16, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

3/4 TON PICKUP

Item No. 22

FSN

Truck; pickup body;
Type IX; 5800 minimum GVW; in accordance
with Int. Fed. Spec. KKK-T-00723(GSA-FSS);
118-inch minimum wheelbase; equipped with:
8-17.5, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

Int. Fed. Std. No. 00122c(GSA-FSS)

1 TON PICKUP

Item No. 23

FSN

Truck; pickup body;
Type XII; 7000 minimum GVW; in accordance
with Int. Fed. Spec. KKK-T-00723(GSA-FSS);
125-inch minimum wheelbase; equipped with:
8-19.5, 8-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

1/2 TON PANEL - WITH METAL SIDE PANELS (FORWARD CONTROL)

Item No. 30

FSN

Truck; panel body - with metal side panels; forward control;
Type II; 4000 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
90-inch minimum wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

1/2 TON PANEL - WITH GLASS SIDE PANELS (FORWARD CONTROL)

Item No. 31

FSN

Truck; panel body with glass side panels; forward control;
Type III; 4000 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
90-inch minimum wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

1/2 TON PANEL

Item No. 32

FSN

Truck; panel body; Type V; 4800 minimum GVW;
in accordance with Int. Fed. Spec. KKK-T-00723
(GSA-FSS); 110-inch minimum wheelbase; equipped
with:
6.50 X 16, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

Int. Fed. Std. No. 00122c(GSA-FSS)

1 TON PANEL - 9-FOOT BODY, MINIMUM

Item No. 33

FSN

Truck; 9-foot panel body; minimum;
Type XIII; 7000 minimum GVW; in accordance
with Int. Fed. Spec. KKK-T-00723(GSA-FSS);
125-inch minimum wheelbase; equipped with:
8-19.5, 8-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

3/4 TON STAKE

Item No. 40

FSN

Truck; stake body; Type X;
5800 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
118-inch minimum wheelbase; equipped with:
8-17.5, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

1 TON STAKE - LIGHT DUTY

Item No. 41

FSN

Truck; stake body; Type XIV;
7000 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
125-inch minimum wheelbase; equipped with:
8-19.5, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

1 TON STAKE - HEAVY DUTY

Item No. 42

FSN

Truck; stake body; Type XV;
8500 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
124-inch minimum wheelbase; equipped with:
8-19.5, 6-ply tires, minimum; or
8-17.5, 8-ply tires, minimum, dual rear wheels;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

Int. Fed. Std. No. 00122c(GSA-FSS)

1/2 TON CAB AND CHASSIS ONLY

Item No. 50

FSN

Truck; cab and chassis only; Type VI;
4800 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
110-inch minimum wheelbase; equipped with:
6.50 X 16, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

3/4 TON CAB AND CHASSIS ONLY

Item No. 51

FSN

Truck; cab and chassis only; Type XI;
5800 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
118-inch minimum wheelbase; equipped with:
8-17.5, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

1 TON CAB AND CHASSIS ONLY - LIGHT DUTY

Item No. 52

FSN

Truck; cab and chassis only; Type XVI;
7000 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
125-inch minimum wheelbase; equipped with:
8-19.5, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

1 TON CAB AND CHASSIS ONLY - HEAVY DUTY

Item No. 53

FSN

Truck; cab and chassis only; Type XVII;
8500 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS);
125-inch minimum wheelbase; equipped with:
8-19.5, 6-ply tires, minimum; or
8-17.5, 8-ply tires, minimum, dual rear wheels;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

Int. Fed. Std. No. 00122c(GSA-FSS)

SEDAN DELIVERY - WITH METAL SIDE PANELS

Item No. 60

FSN

Truck; sedan delivery body with metal side panels;
Type VIIa; 4000 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS); 90-inch
minimum wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

SEDAN DELIVERY - WITH GLASS SIDE PANELS

Item No. 61

FSN

Truck; sedan delivery body with glass side panels;
Type VIIb; 4000 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS); 90-inch
minimum wheelbase; equipped with:
6.50 X 13, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

SEDAN DELIVERY - WITH GLASS SIDE PANELS

Item No. 62

FSN

Truck; sedan delivery body with glass side panels;
Type VIII; 4200 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS); 115-inch
minimum wheelbase; equipped with:
8.00 X 14, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

CARRYALL

Item No. 70

FSN

Truck; carryall body; Type XVIII; 4800 minimum
GVW; in accordance with Int. Fed. Spec. KKK-T-00723(GSA-FSS);
114-inch minimum wheelbase; equipped with:
6.50 X 16, 6-ply tires, minimum;
heater and defrosters, fresh air type;
70-amp. hour minimum battery.

Int. Fed. Std. No. 00122c(GSA-FSS)

S5. Deviations and changes.

S5.1 Deviations.

S5.1.1 Minor deviations. - This standard does not prohibit minor total expenditures for alterations or modifications after receipt of vehicle under the following conditions: (1) alterations and modifications shall be for unusual service requirements of the using activity; (2) the expenditure shall not exceed 5 percent of the total cost of the vehicle or \$75 whichever is less; and (3) the total cost of the vehicle, plus alterations or modifications, shall not exceed the statutory limitations.

S5.1.2 Major single purchase deviations. - When an agency feels that because of operating conditions peculiar to a particular vehicle a deviation from the standard item is required other than as provided under Minor Deviations (see S5.1.1), and the options of tables I, II and III, complete justification should be submitted to the procuring activity. This justification should accompany the requisition and should include detailed information describing the type of operation involved and any special physical conditions to be encountered.

S5.2 Changes. - When a Federal agency, other than as provided in S5.2.1, considers that a Federal standard does not provide for its essential need, written request for adding to or otherwise changing the standard, supported by adequate justification, shall be sent to the Administration. This justification shall explain wherein the standard does not provide for essential needs. The request shall be sent in duplicate to the General Services Administration, Federal Supply Service, Standardization Division, Washington 25, D. C. The Administration will determine the appropriate action to be taken and will notify the agency.

S5.2.1 Military services. - When any Military agency considers that this Federal standard does not provide for its essential needs, desired changes shall be requested in accordance with established Department of Defense procedures. If the military agency responsible for purchase of the vehicle(s) concerned concurs in the requested changes, they will be forwarded to the General Services Administration, Standardization Division, with appropriate recommendations.

S6. Conflict with referenced specifications. - Where the requirements specified in this standard conflict with any requirements in referenced specifications, the requirements of the standard shall apply. Nature of conflict between the standard and the referenced specification shall be submitted in duplicate to Standardization Division, Federal Supply Service, Regional Office Building, General Services Administration, Washington 25, D. C.

Single copies of this standard are available without charge at the GSA Regional Offices in Boston, New York, Atlanta, Chicago, Kansas City, Mo., Dallas, Denver, San Francisco, Los Angeles, Seattle, and Washington, D.C. Additional copies may be purchased for 10 cents each from the General Services Administration, Business Service Center, Region 3, Seventh and D Streets, S. W., Washington 25, D. C.

Int. Fed. Std. No. 00122c(GSA-FSS)
Amendment-1
January 1, 1961

INTERIM FEDERAL STANDARD

AUTOMOBILES, STATION WAGONS, AND LIGHT TRUCKS;
STANDARD UNITS, STANDARD PERMISSIBLE OPTIONS,
JUSTIFIABLE OPTIONS AND STANDARD LAW ENFORCEMENT OPTIONS

This amendment forms a part of Interim Federal Standard No. 00122c(GSA-FSS),
dated January 1, 1961.

Page 4, table II: Delete and substitute:

Table II. - Standard permissible options - (permissible to all
agencies except as indicated in table*)

Vehicle	Option
Station wagons (items 12, 13 and 14)	8-cylinder engines.
All types vehicles herein	Standard transmission. Automatic transmission.
Light trucks; sedan deliveries; or carryalls (items 20 thru 23; 30 thru 33; 40 thru 42; 50 thru 53; 60 thru 62; and 70)	Tires, tubeless; Tires with tubes; or Tires, mud and snow.
All vehicles herein	Painted any single standard production color or to match any color of Fed. Std. No. 595.
All types vehicles herein	Special traction differential (Interim Fed. Spec. KKK-D-00350a(GSA-FSS).)
Sedan deliveries (item 62)	6.70 X 15, or 8.00 X 14, 6-ply tires; and heavy duty rear springs.
All vehicles herein	Seat belts.
Item 21	(a) 105 B.H.P; and 6.70 X 15, 4-ply tires. (b) Rear bumpers.
Items 21, 32, 50 and 70	Four-speed transmission.
All types vehicles herein	Undercoating.
*For Department of Defense only, all nontactical vehicles	Radio-interference suppression in accordance with Military Specification MIL-S-10379.

AMENDMENT-1

Int. Fed. Std. No. 00122c(GSA-FSS)

Page 6, Item No. 1, fifth line: Delete "6.50 X 13, 4-ply tires, minimum" and substitute "6.00 X 13, 4-ply tires, minimum".

Page 7, Item No. 10, sixth line: Delete "6.70 X 15, 4-ply tires, minimum" and substitute "6.50 X 15, 4-ply tires, minimum".

Page 7, Item No. 11, sixth line: Delete "6.70 X 15, 4-ply tires, minimum" and substitute "6.50 X 15, 4-ply tires, minimum".

Page 8, Item No. 20, first line: After "truck; pickup body;" add "forward control;"

Page 12, Item No. 60, second line: Delete "4000" and substitute "3200".

Page 12, Item No. 61, second line: Delete "4000" and substitute: "3200".

Page 12, Item No. 62: Delete and substitute:

SEDAN DELIVERY - WITH GLASS SIDE PANELS

Item No. 62

FSN

Truck; sedan delivery body with glass side panels;
Type VIII; 4200 minimum GVW; in accordance with
Int. Fed. Spec. KKK-T-00723(GSA-FSS); 108-inch
minimum wheelbase; equipped with:
8.00 X 14, 4-ply tires, minimum;
6.70 X 15, 4-ply tires, minimum;
heater and defrosters, fresh air type;
40-amp. hour minimum battery.

Mr. ROBERTS. The following quotation, to be found on pages 5 and 6, of a recent publication of the New York State Automobile Association, entitled "How Our State Can Measure Up to Its Traffic Safety Needs" will be of interest in connection with the proposed legislation:

II. THE VEHICLE

"Vehicle and vehicle equipment design and condition are obvious considerations in accident causation, and the State has long been concerned with them."—Interdepartmental Traffic Safety Committee Report, November 1959.

Safety equipment

As a matter of fact, the history of safety improvements in the American motor car is characterized by the initiative of State legislatures in mandating what are now considered to be basic safety measures—stop lights, directional signals, wipers, shatter-proof windshields.

It is no secret that tire blowouts continue to result in serious accidents. Yet, blowout-proof tires can be produced commercially. Just as no motor vehicle may be sold, today, in New York State without a windshield wiper, it would seem possible that the legislature could mandate the use of blowout-proof tires.

Beyond this step is an entire series of "safe packaging" devices, including seat belts, dashboard padding and positive door locks. It is evident that much can be done to reduce the severity of injury through the use of these devices.

The need

The State of New York should examine claims for devices to make vehicles safer and, if the claims appear to be valid, should mandate the use of these devices.

(The following information was submitted for the record:)

GENERAL SERVICES ADMINISTRATION,
Washington, D.C., April 26, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: In response to your request of April 10, 1961, for the views of the General Services Administration on the eight safety recommendations made by the American Medical Association, we wish to make the following comments.

The General Services Administration is in full accord with the AMA recommendations. Of these recommendations, implementation of one through seven could reduce the severity of injury in motor vehicle accidents. Recommendation 8, as it pertains to standard signals and improved signaling devices that more clearly indicate the driver's intent, could help to prevent certain types of accidents.

In keeping with the recommendations of the AMA and proven research, the General Services Administration is revising Federal standards and specifications for motor vehicles to require anchors for two seat belts in the front seat and three belts in the rear seat of sedans, and anchors for seat belts for all passengers in station wagons, ambulances, and buses.

In determining the inclusion in the standards of dash and visor padding, which is presently available as a manufacturer's option, we will await the research findings of the Department of Health, Education, and Welfare. If these findings prove the value of padding, we will include it in the procurement standards concurrent with obtaining any needed increase in the statutory price limitation.

Recommendations two through eight will be discussed with both sales and engineering representatives of the vehicle manufacturers. In these discussions we will stress to the full extent possible the desirability of incorporating these safety suggestions into the vehicle design.

We wish to thank you for the opportunity of commenting on the AMA recommendations, and assure you that we will continue to cooperate with your subcommittee.

Sincerely yours,

JOHN L. MOORE, *Administrator.*

THE SECRETARY OF COMMERCE,
Washington, D.C., June 14, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: This is in further response to your letter of April 10 requesting my views on specific safety recommendations made by the American Medical Association in its letter to you dated March 28, 1961.

My comments are in the order of the points set out in the letter from the American Medical Association.

(1) I agree that our motor vehicle manufacturers are to be commended for their announced decision that attachments for seat belts in the front seat will be standard equipment on all 1962 vehicles.

(2) I think it would be good if all automobiles could come equipped with some kind of padding on the dashboard as well as some appropriate padding on the roof of the car and other impact areas. As you can realize the term "crash padding" is a very broad one and what one person or one company would consider adequate in that respect could very well differ from the opinion of others.

(3) I would certainly favor any safety improvement that can be developed for steering wheels. It is of course a question of what is practical and workable and at the same time economical enough so that its use in mass production of automobiles is possible.

(4) Safety door locks in all motor vehicles to guard against doors coming open in event of a crash would seem to be generally desirable. In this connection, however, one must keep in mind the accidents which involve an automobile's plunging into a river or some other body of water—and in those cases it will be highly desirable to have a door assembly and locking mechanism which will enable one to get the doors open rather than keep them shut. The same would of course apply in the event a vehicle caught on fire as a result of an accident. Again, I am sure there are questions of cost as well as practical workability which would simply have to be thought through very carefully before a particular device should be adopted for all motor vehicles.

(5) In my opinion, it is definitely desirable to design and construct the interior of automobiles so as to eliminate or hold to the very minimum protruding knobs, handles, and sharp edges. I personally feel that considerations of appearance dominate to a great extent the decision as to how a dashboard will be constructed as well as door handles, and other features of the interior of an automobile.

(6) The use of the term "improved anchorage of seats" implies that there is both a present need for improvement as well as a feasibility for improvement. While as a theoretical matter I would assume that improvements could be made on this point I am not prepared to make a wholesale condemnation of the present general situation nor to state firm conclusion as to what changes, if any, ought to be made. Neither am I prepared to conclude that seats in an automobile should be high enough to reach the back of a person's head, which would be necessary—I suppose—to prevent the so-called neck-snap injury.

(7) Offhand, I don't think much of the suggestion about providing storage space behind the rear seat so as to protect the passengers from "flying missiles." People are going to be people and a hat, the baby's milk bottle, an apple, or most any other item which a person might have in an automobile will likely be deposited on the seat beside the passenger even though storage space equivalent to that contained in a good-sized pickup truck was available behind the rear seat.

(8) I don't understand the full significance of the suggestion that there be an improved system of "intercommunication between drivers of moving vehicles." I don't know by what practical means this could be done—except possibly by some radio device whereby every car's loudspeaker was wide open on the same channel—or perhaps with the use of a large and efficient megaphone carried on the top of cars or protruding out of the car windows. I don't mean to be facetious on this particular point but I quite frankly fail to see any solid substance in this particular suggestion. In fact, I think we would be promoting safety more if we emphasized to drivers that they should communicate less—either with their fellow passengers or with the drivers of other vehicles.

I would like to offer this overall observation concerning the many specific (and often very constructive) suggestions that might be offered as improved safety

features of motor vehicles. First, the greatest and most effective safety feature in an automobile cannot be installed at the factory. I refer to the driver. Highway accident statistics demonstrate conclusively that driver faults—both deliberate and unintentional—account for the overwhelming majority of highway accidents. Second, no single safety design or feature of an automobile is likely ever to do quite as much as that particular feature's enthusiastic backers would suppose. For example, safety belts, even when securely fastened around the passenger, constitutes no 100-percent guarantee; and such guarantee as there is dwindles to zero when the driver or the passenger does not have the safety belt fastened around his middle. I mention this simply to emphasize that as a practical matter we always come back to the people who ride in automobiles.

Next, I would like to emphasize my personal opinion that the theoretical value of a particular device or design in a motor vehicle must be analyzed carefully in terms of the reasonably expected net practical value, including consideration of the human factor in using the equipment involved and the economic cost involved.

In the final analysis, the people of the country who buy automobiles must pay for any improved safety features which are built into the automobile at the factory—to the extent that such safety features add to cost. I doubt seriously that the average automobile purchaser will want to increase the cost of his purchase any considerable amount unless the safety case is very clearly and overwhelmingly made. I do think that the continuing challenge which confronts our automobile manufacturers is to find ways of improving safety features and introducing new safety features in our motor vehicles, at a cost which is reasonable in the marketplace. Also, I am equally convinced that there are some things which could be done in the manufacture of motor vehicles which would contribute to greater safety and which could be done at little or no extra cost to the manufacturer or to the purchaser. For example, I see no reason why the interior of automobiles can't be designed so as to eliminate most sharp edges, protruding knobs, handles, etc.

You asked in your letter whether in my opinion some or all of these safety features should be required for the motor vehicles purchased by the Federal Government. The only one of these specific items that I would suggest, as of right now, be required for motor vehicles purchased by the Federal Government is No. 1, regarding adequate anchorage points for seat belts—and the manufacturing companies will be meeting this next year.

I hope these comments will be helpful to you and the members of your subcommittee.

Sincerely yours,

LUTHER H. HODGES.

THE SECRETARY OF COMMERCE,
Washington, D.C., June 6, 1961.

HON. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Further reference is made to your letter of April 10 asking our views as to whether tempered glass now being used in side and vent windows of automobiles is more hazardous than laminated glass.

The Bureau of Public Roads has not undertaken any scientific research on vehicle safety glass itself but has some knowledge of existing practice and trends. State laws have required laminated glass windshields for many years, but tempered glass has been coming into increasing application for other glass areas in the vehicle. Laminated glass is generally thought to be superior for windshields because it remains reasonably clear even when cracked or broken, in contrast to the cloudy appearance often presented when tempered glass is broken. The latter is stronger, however, and will withstand forces that fracture laminated glass. In much of Europe, tempered glass is used for windshields as well as for side glass.

A study based on scanty data from the automotive crash injury research project at Cornell dealt with the relative effects of laminated and tempered glass in side and vent windows as an injury factor. This analysis is regarded inconclusive because a total of only 27 persons were injured by contact with side window glass. Nearly all injuries were cuts and, although these were

associated more with laminated than with tempered glass, the exposure to injury by the two types of glass does not appear to have been controlled sufficiently well to make any real judgment as to their relative value, safetywise.

Glass replacement suppliers, dealers and distributors, and others have been active in creating recent interest in the controversy between the two types of glass. We are informed that the American Standards Association has begun a review of the situation, and that additional analyses of the Cornell accident data may be undertaken.

The prospects for definite resolution of this particular question from study of existing accident experience seem less bright than the chance for better understanding and fulfillment of the glass structure safety needs through an intensification of research and development work. The variety of automobile collisions make unique and widely differing demands on safety glass, but the ideal glass for a crash impact probably would have controllable deformation and failure characteristics more appropriate to its application. We believe that the automotive industries and the various levels of government working cooperatively can meet the problem, and the Department of Commerce and the Bureau of Public Roads would naturally assist in any area where its available competence and facilities permit.

We hope that this information will be helpful to you and to the Subcommittee on Health and Safety.

Sincerely yours,

LUTHER H. HODGES,
Secretary of Commerce.

KUHN CLINIC,
Hammond, Ind., April 19, 1961.

Congressman KENNETH ROBERTS,
*House Office Building,
Washington, D.C.*

DEAR CONGRESSMAN ROBERTS: Have just returned from an annual meeting of the National Society for Prevention of Blindness, where I gave a paper on Modern Industrial Eye Programs. At this meeting and at a previous meeting of the Industrial Advisory Committee of this national organization of which I am a member, the question of glass in automobiles was brought up.

While the official stand of the National Society for Prevention of Blindness will depend on the findings of the American Standards Association, they being equipped to do experimental work, we did see some films which were very important indicating the impact resistance of tempered glass, plain glass, and laminated glass. There was no question, in my mind at least, that the laminated glass was the only sure protection, especially in the windshield but also for passengers riding near the windows on the side.

My attention has been called by several people to the fact that comments are being made indicating that industry is using tempered lens for safety glasses, therefore it must be better for automobiles. There are special reasons why a case-hardened (i.e., tempered) lense is used in industry. The particles that a worker is being protected from are very tiny and come very fast. The tempered lens has proven to be, by endless and expensive experimentation, the best protection possible for the worker's eyes.

Laminated glass used to be used for protection, before they had the modern knowledge of tempering glasses for eye protection advanced as far as it is now. It is a facetious statement for anyone to make that because tempered lens chosen for tiny areas of glass in safety goggles, for fast moving tiny particles where the impact is certainly different than on a windshield or in a car, has any relationship to the automobile.

In all the investigations that I have known, I cannot see (and I'm speaking personally not officially as a member of the NSPB Advisory Committee) how there can be any question about the importance of the continued use of laminated glass in windshields. Not only does the other fracture and if you have seen the film put out by the Monsanto Chemical Co., the demonstration will prove it very definitely for you. All other types splinter into many loose pieces.

It would seem too bad when the effort is being made by everyone including your committee, to increase safety in automobiles that this backward step should be taken. If your hearings are later published, I should very much like to have a copy.

Sincerely,

HEDWIG S. KUHN, M.D.

THE COLUMBUS MEDICAL CENTER,
Columbus, Ohio, April 13, 1961.

Hon. KENNETH ROBERTS,
House of Representatives, Washington, D.C.

DEAR CONGRESSMAN ROBERTS: I note that you are chairman of a subcommittee which is deliberating legislation authorizing the Federal Government to require safety features on autos purchased by the Government.

I am writing to endorse such legislation, with particular emphasis on safety belts.

You have, I am sure, heard much of the authoritative reports on the reduced mortality in auto accidents when safety belts are worn. I would like to emphasize two points which may perhaps have escaped emphasis previously.

Having worn a safety belt myself for the past year, I can report that it is more comfortable for the driver to employ a safety belt than to go without. This was a bonus, for I expected to put up with discomfort in order to achieve greater safety.

Another point is that occasionally, relatively minor mishaps may cause the auto driver to be shaken away from the steering wheel. For example, if a car runs off the road onto the shoulder, a sudden bumpiness may cause him to be jostled about and thereupon loses control of the steering wheel. If he uses a seat belt, however, the driver is much less likely to be thrown about and thereby suffer a major accident.

I hope that the Congress passes this legislation.

Very truly yours,

WARREN W. SMITH, M.D.

STATEMENT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION BY BERWYN F.
MATTISON, M.D., EXECUTIVE DIRECTOR, MARCH 27, 1961

The American Public Health Association, 1790 Broadway, New York, N.Y., is appreciative of this opportunity to present to this committee its views on H.R. 1341 introduced by committee chairman, Mr. Roberts of Alabama, and H.R. 903 introduced by Mr. Bennett of Florida, both relating to the problems of automobile safety. It was my pleasure to appear before this subcommittee in July 1959 to present testimony on similar legislation. The APHA believes that the activities of this congressional committee in the area of accident prevention and highway safety are most commendable and that the people of this Nation are indebted to the committee for the concern and attention that is focused on this problem as a result of these hearings.

As I stated in my previous appearance, we in public health are much concerned over the alarming increase in accidental injury and death, a large portion of which results from motor vehicle accidents. In the past 4 to 5 decades, we have seen a dramatic reduction of morbidity and mortality from the communicable diseases. On the other hand, there has been a terrifying increase in deaths and in disabling injuries due to motor vehicle and other accidents. We believe that the cooperation which brought about the aforementioned reduction in communicable diseases might be used to some degree as a pattern whereby similar advances could be made against motor vehicle accidents. This cooperation was affected between medicine and allied professions, private research laboratories, university laboratories, and the Government through health agencies at the Federal, State, and local levels. Would it not be possible to accomplish the presently desired end by a similar cooperative arrangement involving medicine, research, the automobile and allied industries and appropriate private and governmental agencies?

The American Public Health Association, in a policy statement adopted only last November, urged that research efforts in the field of accident prevention be significantly increased in number, scope, and depth so as to embrace the study and control of all types of accidents regardless of the place of occurrence. It appears to us that this is the weakest point in present efforts. There is, as of the moment, no entity adequately financed and staffed to even coordinate individual efforts to say nothing of conducting adequate research on this problem. In the aforementioned policy statement, the APHA urged additional funds for both the Public Health Service and the Children's Bureau, Department of Health, Education, and Welfare, to encourage and support additional research efforts to assist State and local health departments in developing more effective

accident programs. Greater attention must be directed to identifying the human factors involved in accidents and in the developing of effective methods to cope with them. There should be a marked increase too in educational efforts designed to dispel the ignorance about the basic causes of accidents and the role which people play in their causation. There appears to us to be entirely too much of an attitude of fatalism in regard to accidents rather than a frame of mind which would emphasize a positive approach toward human endeavor to prevent accidents.

The activities of this committee and the interest of its several members has played no small part in some of the advances which have already been made in the field of motor vehicle accident prevention. Certainly the now rapidly advancing acceptance of the installation and use of seat belts should bring a deep sense of satisfaction to this committee. Even after the submission of scientific evidence that the proper use of seat belts would materially reduce injuries and death from motor vehicle accidents, it has taken years to accomplish a common acceptance of the need for this device. The APHA, as this committee must certainly also be, is most gratified to know that beginning with the 1962 models our major American manufacturers will install, as standard equipment on every car manufactured, the mounts to which seat belts can be attached.

The acceptance of directional signal lights provides a similar story of slow but steady progress. First, directional lights were available on the most expensive models of American automobiles, then they became available as optional equipment at an increased cost to the purchaser, and now they are accepted as a necessary and integral part of the equipment which belongs on every car regardless of cost. In certain of our States, as the committee knows, directional signal lights are legally mandatory.

Without question every reasonable step should be taken to reduce injury and death producing automobile accidents. The most frequently cited contributors to such accidents are excessive speed, drinking and driving, driving with faulty automotive equipment such as brakes, lights, or turn signals, and the lack of adequate observation by pedestrians. Those portions of the bills being considered which might effectively control speed, assure the proper functioning of the automobile and the greatest measure of protection to its occupants, and provide to the driver the greatest opportunity to convey his intentions should serve a useful purpose in the preventing of accidents. As I stated in my previous testimony, a study published by the American Journal of Public Health in November 1958 indicated a sharp increase of the percentage of occupants receiving dangerous or fatal injuries when the accidents involved impacts at speeds of more than 60 miles per hour. The occupants of cars traveling at this rate of speed or more received dangerous or fatal injuries at a ratio three times as great as among the occupants of automobiles traveling at less than 60 miles per hour.

We believe that considerable additional research is required in respect to the interior design of automobiles and the development of standards for these and other safety appliances. It would appear to our association that a sizable increase in the research on ways to diminish injury and death as the result of motor vehicle accidents should be an immediate function of the Federal Government through the U.S. Public Health Service. We believe it essential to develop proven standards for safety appliances; and when such standards have been developed and then utilized on vehicles purchased by the Federal Government, this would serve as a most useful guide for the similar equipping of other cars.

Relating again to my previous statement, we believe that there remains a major question as to whether or not our present knowledge is sufficient to establish the proper standards in the safety design of motor vehicles and in the application of the most effective control measures. As in 1959, I believe still that it is vital that there be a major extension of testing and experimentation in such standards and their application before control measures can be really effective. We believe that the Department of Health, Education, and Welfare through the Public Health Service has proved its competence in the field of general health and that it has further proved its competence in the field of accident prevention within the limit of finances and personnel. We urge again the consideration by this committee of the establishment of a National Accident Prevention Center where basic research and applied research would lead to the development of safety standards and new techniques of reducing death and injury.

The American Public Health Association is grateful for this opportunity to present our considered judgment to this committee.

STATE COLLEGE, PA., May 9, 1961.

HON. JAMES E. VAN ZANDT,
House of Representatives,
Washington, D.C.

DEAR CONGRESSMAN VAN ZANDT: Thank you for your letter of April 26. In accordance with your suggestion I have prepared a statement specially for the House Interstate and Foreign Commerce Committee Subcommittee on Health and Safety, and which I enclose in duplicate.

Please excuse my delay as I have not been too well.

Yours very sincerely,

R. K. Y. DUSINBERRE, M.D.

P.S.—Also enclosed is a copy of my editorial for the committee.

R.K.Y.D.

A STATEMENT, CONCERNING THE RELATIVE SAFETY OF TRUCK AND RAIL FREIGHT
TRANSPORT, FROM A MEDICAL PREVENTIVE POINT OF VIEW

1. Personal. Before retirement from the Navy in 1954, the author wrote a book, "Safety in Driving," designed to reduce the deplorable traffic mortality in that service. Since retirement he has studied the traffic mortality problem, with view to making contributions or improvements not previously recognized. Some brief articles were published in the Williamsport Sun Gazette, and some resolutions were sponsored by the Centre County Medical Society.

2. The problem. A current political problem is the question of the growth of piggyback freight. The trucking industry complains (Harpers magazine, March 1961) that the railroads are unfair, in that the railroads offer indiscriminately low rates for piggyback freight, while the trucking industry must charge higher rates, according to the value of the cargo. Both industries are here to stay and both may be expected to compete without mercy. Both claim to work in the public interest, and demand legislative support, so to an extent their claims must be spurious or in conflict, or else the public interest has not yet been fully clarified. Upon what basis, not heretofore recognized, can the legislator base a policy of support for or discouragement of, piggyback freighting? I submit that the public interest in mortality is the first and most important determinant.

3. The public interest. The word "safety," is an exasperating word, meaning what the user intends it to mean, usually in his own interest. But when General Quesada wrote in the Harpers magazine of the "public interest" in air safety, he obviously meant safety to life and limb almost exclusively. Air transport measures its "safety" in deaths per passenger mile of travel. Whereas property interest in airplanes is not an insignificant interest, it is a negligible one, in the public mind. Further, an air disaster, unlike an auto or truck accident, carries a relatively negligible injury component. Passengers are usually all killed, or walk away from the wreck, unharmed. Finally, to the public, simple property damage carries little interest whatever. In the coal industry, safety has been for years measured by deaths per ton of coal mined, and is so listed in the World Almanac. Contrariwise, the trucking operation is characterized by a large number of simple property damage accidents, and a truck may even be a total loss without even any injury to the truck driver. Trucking safety programs consequently emphasize prevention of accidents, and the prevention of death is secondary. The industry compares its accident safety record with that of the automobile, since from that view it can gain by comparison. Finally it emphasizes accident prevention because that is the conventional line of effort of the safety expert, so it has not occurred to anyone to challenge this viewpoint in measuring their safety program. Since the accident comparison makes the truck look good, little restriction is put on the truck except a somewhat lower speed limit. The Garden State Parkway of New Jersey, carrying only cars, has a uniformly lower death rate than superhighways carrying mixed car and truck traffic, but no particular use of this fact is made in restricting truck performance.

4. The basis for comparison. The only basis for comparison of the safety of truck and rail transport is by deaths per ton-mile of freight hauled, because those are the only elements they have in common outside of property loss, which from the medical preventive view is not irrelevant, but negligible in the public interest, compared with fatalities. On June 12, 1956, the Williamsport Sun Gazette published my first comparison of truck and rail fatalities on a ton-mile basis. Since then I have continually attempted to verify the estimate with other statistics, and the last computation was as follows:

5. Computation of deaths per ton-mile of freight for the truck and rail industries. Below is a verbatim copy of the Pennsylvania Department of Highway Safety study.

Study of commercial car highway deaths, in 1951:

Total deaths in traffic accidents.....	1,643
Total deaths in accidents involving commercial cars.....	433
Percentage of commercial car deaths to total deaths.....	26
Commercial car deaths in rural areas.....	321
Commercial car deaths in urban areas.....	112
Rural area deaths caused by collision of commercial car with—	
1. Motorvehicle.....	214
2. Pedestrian.....	44
3. Fixed object.....	24
4. Railroad.....	4
5. Other.....	—
6. Noncollision.....	25

N.B.—Commercial car covers all trucks including both tractor-trailer and smaller trucks. It also covers ambulances, fire engines, and similar service equipment.

THEODORE CHANDLER, JR.,
Statistician, Bureau of Highway Safety.

From this we can charge trucking in Pennsylvania in 1951 with a rockbottom minimum responsibility for 49 single-truck accident deaths (24 and 25). The Interstate Commerce Commission classifies such accidents and deaths as "preventable" and also includes truck-train collisions. Doubtless that Commission believes that in such accidents only the driver or truck can be charged with the blame. In fact, in such accidents only the truckdriver gets killed. Since responsibility for other type accidents may be arguable, we arbitrarily dismiss them for the moment in spite of their number. Nevertheless we do not finally dismiss the probability that truckdrivers were responsible for some of the two-vehicle collision deaths, and certainly for the two-truck collision deaths.

Forty-nine truckdriver deaths are 3 percent of the total deaths, 1,643, for the State that year. For the Nation, in Accident Facts (National Safety Council) we learn, however, that fatalities involving "motor-scooters, motorized bicycles, fire-equipment, ambulances, etc.," account for 1 percent of the national fatalities. Therefore we again arbitrarily reduce the minimum trucking responsibility from 3 percent to 2 percent, ignoring the absurdity of lumping all these desperate vehicles in one category by the statisticians for any purpose, because we have no other statistics available. Taking 2 percent of the national traffic kill for 1954 of 36,000, we get the figure 720 as the minimum fatalities chargeable to trucking, or rural routes, in only single-vehicle accidents, and involving probably only truckdrivers themselves.

Next we determine the minimum railroad fatalities from Accident Facts for 1954.

Trespassers.....	860
Persons in grade-crossing accidents.....	1,377
Total.....	2,237
Passengers on trains.....	23
Travelers not on trains.....	6
Employees on duty.....	228
Other nontrespassers.....	131
Total.....	388
Total.....	2,625

We absolve the railroads from responsibility for deaths to trespassers who evade the police, and ride the rods. We excuse the railroads from responsibility in grade-crossing deaths, fault of the truck or car driver, in the view of the Interstate Commerce Commission. But we charge them with all the other deaths, to be fair to trucking, even though many of the 388 deaths were in no way connected with the actual hauling of freight, i.e., shop employees. To repeat, we charge the railroads, but excuse the trucker from responsibility for

deaths about which there may be any element of debate, in order to lean over backward to be fair to trucking. We charge the railroads with responsibility for 388 deaths that year, due to hauling freight.

Next, we learn from Statistical Abstracts of the United States for 1957 that trucks hauled 214 billion ton-miles of freight in intercity routes of over 1 mile, while railroads hauled 556 billion ton-miles of freight (BTM). By division we get our answers:

$$\frac{388 \text{ deaths}}{556 \text{ BTM}} = 0.7 \text{ death per BTM for railroads.}$$

$$\frac{720 \text{ deaths}}{214 \text{ BTM}} = 3.3 \text{ deaths per BTM for trucking.}$$

Thus trucking kills about four times as many truckdrivers alone, per ton-mile of freight, as do the railroads. Reverting now to the original statistic, we note that in Pennsylvania, 214 deaths on rural routes alone involved trucks or commercial vehicles, or about four times the minimum fatalities for trucks. So if we were to charge trucking with responsibility for only one-fourth of the deaths in two-car accidents, we would more than double our estimate of the minimum chargeable to trucking.

6. Verification: Since making these estimates, I have tried by correspondence to get figures that would serve to make them more accurate. These efforts have failed in most directions. But that failure is most significant itself. Of all the national organizations to which I have written, presumably interested in the safety of trucking, not one, except the ICC, could give me the number of truck drivers that were killed in the course of their work, even to the extent that they could be expected to ascertain that figure in their own organization. Only those firms in interstate commerce are required to report to the Interstate Commerce Commission, so their figures are limited. In one quarter of 1960 40 truckdriver deaths were reported to the Commission, of which 20 were from "preventable" single-truck accidents (running off the road, collision with fixed object). From this we may presume that from 80 to 160 truckdriver deaths are reported to the ICC alone, exclusive of other driver and nondriver deaths justly chargeable to trucking, if each accident were closely analyzed. In New York State in 1960 there were 42 single-vehicle fatal truck accidents of which 21 were fixed object and 21 noncollision. In California in 1960 there were 96 fatal single-truck collisions. It is easy to see how limited is the reporting to the ICC, and that a national survey would produce a figure for truckdriver deaths much nearer to my estimate.

The Bureau of Labor Statistics cannot tell how many truckdrivers lose their lives each year in the course of their work. The National Safety Council cannot tell. It gets its figures from the States, which do not break down their figures into significant subdivisions. A national insurance association cannot tell, nor tell where the figure might be found; the occupational hazard is unknown.

A startling failure is that of the trucking industry to keep track of the number. But the objective of their safety program is to reduce accidents primarily, and death and injury only incidentally. The industry compares its accident record with its own former record, to its credit. Naturally, it prefers a comparison that puts it in the best light. It is unable, if it would, to compare its safety record with that of the railroads on a ton-mile basis respecting fatalities. Consequently when the trucking industry challenges railroad practices, including piggy-back freighting, in Harpers magazine, March 1961, no mention whatever is made of the relative risk of life of the two forms of transport. Obviously the word "safety" to the trucking industry is a spurious name for a property conservation program. Well may it omit mention of fatalities in complaining over piggy-backing.

Probably the most startling failure is that of the truckdrivers union to keep track of their own share of the mortality. Perhaps the union insures its members, but this is not prevention. The union cannot be said to have a safety program in the public interest in mortality. This omission was called to the attention of the president of that union, but to date only acknowledgement of the letter has been received.

7. Conclusion: The only realistic criterion of safety of the trucking industry, compared with that of the rail freight industry, is presented and analyzed—deaths per ton-mile of freight hauled. The assumption is made that safety programs should be primarily life protection programs, as in the field of air transport, and not primarily property protection programs, as in the trucking

industry. A justification is made in the public interest in mortality, for the vigorous promotion of piggy-back freight, in order to get off the highways as much as possible, the freight of the Nation.

The author of this statement is ready to answer criticisms of this analysis, and answer questions about it.

REDUCTION OF TRAFFIC MORTALITY

There is hardly a field of mortality that cries for attention by the profession so much as the reduction of traffic mortality through prevention. To the extent that the problem is political, involving conflicts of interest, the profession appears to take little interest. The need of the moment is for medicine to formulate medical traffic policies of its own and take an explicit stand on current issues—the use of radar in enforcement, for example.

An illustration of action in this field is in order. The Centre County Medical Society introduced a resolution at the 1958 annual meeting of the house of delegates of the Pennsylvania Medical Society calling for the elimination of sirens and bells from ambulances, and for prohibition of excess speed by ambulances. The resolution passed unanimously. It now remains for the legislature to bring the operation of ambulances in line with medical interest in public health.

This year the Centre County Medical Society has submitted to the delegates two resolutions concerning alcohol and speed limits. Medicine could support other projects such as legislation for radar, the use of speed governors on all cars including trucks, selective restriction of different categories of drivers, and the submission of controversial questions to the electorate for referendum, and thereby accelerate the reduction of traffic fatalities.

The reasons for the support of all these measures are beyond the scope of this paper. The failure of current measures to control the speed of irresponsible and immature drivers and the abuse of power and speed by commercial vehicles are matters for serious concern and vigorous action by the profession.

Consider one medical question in point—whether truckdriving is “safe” for truckdrivers themselves irrespective of the menace of trucks to others. No one, not even those who profess to take an interest in trucking safety, can tell how many truckdrivers lose their lives each year in the course of their work. The Bureau of Highway Safety does not know. Presumably the figure could be obtained from the reports of fatal accidents if it had any significance for the current safety viewpoint. The National Safety Council, which obtains its figures from the States’ reports, cannot tell, nor can the American Trucking Association. The truck drivers’ union, on being interrogated, also cannot tell either. Why not? Is not the occupational mortality of their chief workers of as much concern to the latter organizations as it is to the United Mine Workers? How can the premium rates for their welfare funds be computed scientifically when mortality rates are nonexistent? A national insurance association not only cannot tell what the occupational risk is but cannot tell where the information can be found. The Bureau of Labor Statistics does not have the figures, so how can public health authorities know? My own computations from available figures indicate that about 1,000 truckers a year are killed in the United States in noncollision accidents alone, for which only they are responsible. But it is impossible to verify the estimate from any organization presumably interested in highway safety or in truckers.

The significance of this is startling. In the clamor of authority and opinion in traffic safety affairs, the voice of medicine is not heard. Even medicine does not have the figures on mortality of truckdrivers. Yet the maximum speed of trucks was advanced in this State recently from 30 to 50 miles per hour, and according to the bill, “for the protection of public safety.” The vote on the bill was 196 to 2 in the house. It is impossible to suppose that the viewpoint of public health was represented in the hearings on the bill when we have no mortality figures on truckers, and when only two members were found to oppose the bill. Trucks were involved in one-quarter of the traffic deaths in Pennsylvania in 1951, though without doubt not all were chargeable to the truckdrivers. It is a medical and legislative paradox that mortality should be completely overlooked or ignored in a bill designed to protect life (safety).

The reason is not hard to find. The word “safety” has come to mean the reduction of accidents, not of traffic deaths. The secretary of a safety council writes: “We are not interested in mortality reduction per se. Our philosophy is, through our myriad of operations, to prevent the accident in the first place

and then death and injury reduction will automatically be taken care of." Doctors who will flinch at the idea that death and injury reduction will ever be taken care of "automatically" will find on closer study that it has not in fact been so taken care of. Over the years accident reduction programs have been made to serve as the justification (plausible enough from the figures furnished) for the advancement in the power, weight, and speed of vehicles, irrespective of their killing power. The increased death rate for the remaining accidents is obscured by the reduction in the mere number of accidents. Trivial accidents and monetary losses are reduced, but not mortality. Thus, in reality, a materialistic, not a humanitarian, concept of safety dominates public thinking and the development of traffic.

A policy of emphasis on accident reduction, with secondary interest in the mortality potential of the remaining accidents, works like the misdirection movements of a magician. It only appears to reduce mortality, being coincidental with a general diminution in deaths per vehicle-mile. Actually, it does not serve this purpose because it is designed to offer not the slightest impediment to the relentless advance in the speed and weight of vehicles. How can it, indeed, when these factors are none of the business of safety authorities? The weight of vehicles is the concern of the Bureau of Labor and Industry, while the speed limits are the province of the department of highways. This leaves to the bureau of highway safety the promotion of good driving.

Further to insure that no impediment is offered to the unending and unnecessary advance of speed and weight of vehicles, the irrelevant dogma is widely reiterated that speed "of itself" does not cause accidents. Neither does alcohol "of itself" cause accidents. It is a gross error to suppose that we can go on forever having as much speed as anyone wants or thinks he needs simply because all accidents have more than one cause, and when the importance of the various causes varies with the interest of the observer.

To conclude, medicine has a preeminent responsibility, secondary to none, in traffic mortality, since the political problem is common between the selfish and commercial interest of drivers on the one hand and the public interest in health on the other. Everyone is concerned with the risk of death, whether he drives or not, since everyone must ride. Millions of women who can only ride have no influence on the advance of speed. It is the delinquent driver that determines the ceaseless advance of speed limits by contributing to their progressive destruction. If the back-seat drivers could vote, they might well alter the pattern of traffic for the better.

Participation by the whole electorate in traffic policy determination would produce an entirely different order of interest by the public, in contrast with the apathy of which the safety people complain and seem not to be able to understand or improve. Not since the birth of the automobile has anyone ever been allowed to vote on a speed limit. If people had any voice in the traffic policy with which they have to drive, they might be expected the better to support enforcement.

In the interest of public health, it remains for medicine to develop explicit policy in all current controversial traffic questions, including the submission of these questions to the people for decision by referendum. If the people want to kill each other at 60 miles per hour, let them vote on the question and accept the responsibility.—ROBERT K. Y. DUSINBERRE, M.D., State College, Pa.

Mr. ROBERTS. The subcommittee is adjourned, subject to the call of the Chair.

(Whereupon, at 12:25 p.m., the subcommittee adjourned, to reconvene subject to the call of the Chair.)

